CHAPTER - I
INTRODUCTION

1.1 Background of the Study

Stock market is a sensitive place and is influenced by multiple factors. Therefore, forecast about future movement has become global phenomena and a basic concern of financial and economic condition of a nation. Stock market index is perceived as an indicator of investors' confidence to invest in stocks, which obviously, represents economic status of the nation. As capital market is the crucial element in the national economy, its role in reinvigorating and boosting the economic activities in the country holds significance. It helps to mobilize domestic resources. Its role to provide the best investment opportunity by transferring the funds from surplus sectors to deficit sectors through transaction of stocks cannot be ignored. Hence, for the attainment of self-reliant growth of national economy and smooth running of the economic activities of the nation, stock market's role has become major importance in financial management.

The Nepalese stock market is characterized by a low trading volume, absence of professional brokers, early stage of growth, limited movement of share prices, and limited information available to the investors. Thus it is felt necessary to study the possibility of arbitrage profits in the context of smaller and under-developed capital markets, and this study prepared with reference to commercial banks listed in Nepal Stock Exchange Limited (NEPSE) is a small attempt.

The act of raising fund by issuing shares to the public in Nepal started in 1937 A.D. Though the development of securities markets could not be a national policy, Nepal led to institutional development of securities markets with the establishment of Security Exchange Centre (SEC) in 1976 A.D. The SEC used to manage and operate primary and secondary markets of long-term government securities and corporate securities. After some years of establishment, policies and programs were made to develop and promote Stock Exchange and market makers.

With the objectives of regulating securities transactions and protecting interest of the investors, a Security Exchange Act was enacted in 1993 A.D. The act provided some legal and institutional basis for the securities markets development. The SEC was converted into the Nepal Stock Exchange Ltd (NEPSE) in 1993 A.D. with the objectives of operating and managing secondary transaction of securities. After this conversion the open cry out system of trading among the stockbrokers started. It means transaction of the securities is conducted in an open auction principle on the trading floor. The establishment of the specialized firm as NEPSE proved to be a strong step towards liberalization of the economy and a milestone in the path of economic development in the nation.

Under the provision of securities exchange act 1983 A.D., Securities Board Nepal (SEBON) was established in May 26, 1993 A.D. to regulate and manage the securities market. Since its establishment, SEBON has been concentrating its effort to improve the legal and statutory framework. The amendment of that same act was made in 1997 A.D. This amendment made provisions for registering securities businessperson and submitting semi and annual report to SEBON. It is the apex regulator of the securities markets in Nepal. It provides licenses to Stock Exchange and Securities business persons (stockbrokers, securities dealers, market makers, and issue managers) and approves public securities. NEPSE is the market operator and it provides membership to the securities businesspersons. Listed companies and the securities businesspersons report their performance to SEBON and NEPSE.

The Automated Trading System (ATS), an internationally compatible trading system was inaugurated by the then Finance Minister Dr. Ram Sharan Mahat on 24 August 2007. In order to adopt the ATS, NEPSE made an agreement with the British Company Comdaq Limited in November 2006 under the Asian Development Bank (ADB) loan assistance project--Corporate and Financial Governance (CFG)--at the cost of 300 thousand US dollars. The system has been an attempt eliminate all possible human errors as seen in the open out cry trading procedures.

After the introduction of the ATS and with the initiative and guidance of NEPSE, member brokers of NEPSE have started online trading through Wide Area Network (WAN) from their own office from 13 October 2007. Because of this facility, stock brokers can now sell or buy shares from their office. The brokers who have the necessary infrastructure prescribed by NEPSE will get access to WAN. To get access a broker must have a price board, separate rooms along with separate computers for clients' order entry, settlement and must provide up to date information to the clients. From the end of the FY2007/08 all the 23 brokers transact from their office via WAN.

From 19 December 2007 NEPSE has increased the trading hours by one hour due to an increasing trading pressure after the automation of trading. Initially, NEPSE opened its trading activities for only two hours. Now the trading floor opens from 12.00 noon to 15.00. NEPSE has expected that investors in general and small investors in particular will benefit from the increase in trading hours.

NEPSE has started providing real time information (live trading activity) to investors from 28 November 2008. Due to this facility investors can check share prices online from anywhere live during the trading hours. Additionally, without any time gap investors can check trading activities—like top-gainers, top-losers, imposition of trading halt and resumption—on NEPS's web page.

NEPSE started the over-the-counter (OTC) market from 4 June 2008 to give shareholders a chance to sell or buy the shares of companies that are de-listed and that are not listed on NEPSE for failing to meet the listing criteria. (NEPSE Annual Report, 2007/08).

The securities market plays an important role in mobilizing savings and channeling them into productive investment for the development of commerce and industry in the country. It assists the capital formation and economic growth in the country. But, the Nepalese securities market is still in growing stage. Its further development is crucial.

Arbitrage simply means finding two things that are essentially the same and buying the cheaper and selling, or selling short, the more expensive. Arbitrage involves simultaneously, or almost simultaneously, buying long and selling short the same assets, or different but related asset, in an effort to profit from unrealistic price differentials. Profit seeking arbitragers facilitate enforcement of the economic law of one price by buying the stock in the market where its price is lowest and selling in the market where the stock's price is higher. Arbitragers will go on buying at the low price and selling at the higher price until the price of the stock is the same in all free markets around the world. The simple but powerful notion here is that security prices adjust as market participants search for arbitrage profits. When such opportunities have been exhausted, security prices are said to be in equilibrium (Francis J.K., 2001). In this context a definition of market efficiency is the absence of arbitrage opportunities, their having been eliminated by arbitragers (Van Horne:2002).

History indicates that there are two basic theories of stock price behavior or analyzing market efficiency: the technical analysis theory and fundamental analysis theory. Briefly, the technical analysts believe that the forces of supply and demand are reflected in the patterns of price and volume of trading while fundamental analysts believe that the economic environment and earning power are reflected in the pattern of market prices (Fischer and Jordan, 2000). The fundamentalists believe that at any point in time, every share has an intrinsic value which should be in principle be equal to the present value of the future stream of income from that share discounted at an appropriate risk adjusted rate of interest (Bhalla, 1999). Thus, the actual price of the security is considered to be a function of a set of anticipated capitalization rate. The present study represents an effort to improve on shortcomings of the past studies in the hope that the behavior of stock price can be easily understood by identifying the existence or inexistence of arbitrage profits.

1.2 Statement of the Problem

Nepalese stock market as characterized above whether or not provides arbitrage opportunities certainly could be an area of study about which this research has been conducted. On the basis of availability of arbitrage profits in the market or degree of market efficiency, stock market can be categorized as follows:

a) Weakly Efficient Market
b) Semi-strongly Efficient Market
c) Strongly Efficient Market

The weak efficient hypothesis stipulates that historical price and volume data for securities contain no information which can be used to earn a trading profit above what could be attained with a naive buy and hold investment strategy. However, technical analysis theory assumes that the historical behavior of a security is rich in information and that can be used to predict future behavior (Fama, 1965). Technical analysis uses most of the anomalies to extract information on future price movements from historical data. The theory of Random Walk Hypothesis (RWH) or Weak Efficient Market Hypothesis (EMH) attempts to analyze statistically the underlying share price behavior.Week Efficient Market hypothesis suggests that technical analysis is well recorded but worthless folklore.

Semi Strongly efficient market hypothesis specifies that markets are efficient enough for prices to reflect all publicly available information. Consequently, only those insiders who have access to valuable information could earn a profit larger than what could be earned by using a naïve buy and hold strategy in a semi strong efficient market.

Strongly efficient market hypothesis claims that no one can earn arbitrage profit-a profit larger than what could be earned with a naïve buy and hold strategy by trading on short term security price movements. Security markets can be strongly efficient if the rates of stock price changes are independent random variables and none of the market participants use inside information.

So, the forms of the market efficiencies are determined on the basis of whether arbitrage opportunities are available or not in a particular stock market.

Some analysts doubt the concept of stock market efficiency in developing countries due to some reasons. These are:

a) Difficulty in detecting and discriminating among investment opportunities
b) Investment performance is given to physical assets rather than to financial assets, and
c) A dichotomy exists in the financial activities between organized and unorganized money markets etc (Sharma and Kennedy, 1977).

There is no unanimous finding as regard to the effect of capital structure on stock price behavior. Different studies have come up with different findings. Some of the issues are pointed below:

- **Irrational Behavior of Investors**

Some economists, for example Eugene Fama, argue that most of these patterns occur accidentally, rather than as a result of irrational or inefficient behavior of investors. The huge amount of data available to researchers for analysis allegedly causes the fluctuations.

- **Lacks to Reflect the Real Worth of Securities**

The another theory, fundamental analysis, in essence, attempts to estimate the intrinsic value of the security by considering key economic and financial variables and then decide whether the actual price of share is above or under the intrinsic value. Both the theories are included in conventional security analysis theory. Their view about the stock market has been that the prices generally fall to reflect the real worth of securities.

- **Provides More challenges to the Investors**

The theory of efficient market in stock-market prices presents important challenges to both the proponents of technical analysis and of fundamental analysis. For the chartist (technical analysis) the challenge is straight forward. If the efficient market theory is valid description reality, the work of the chartists, like that of the astrologer, is of no real value in the stock market analysis. The empirical evidence provides strong support for the efficient market theory. The only way the chartists can indicate their position is to show that they can consistently use their techniques to make better-than-chance predictions of stock prices.

The challenges of the theory of efficient market to the proponent of fundamental analysis, however, are more involved. If the efficient market theory is valid and if the security exchanges are "efficient" markets then the stock prices at any point in time will represent good estimates of intrinsic or fundamental values. Thus, additional fundamental analysis is of value only when the analyst has new information, which was not fully considered in forming current market prices, or has new insights concerning the effects of generally available information, he may as well forget about the fundamental analysis and choose securities by some random selection procedure.

- **Conflict in Dependency in the Theories**

The weak form of EMH or RWH theory is just opposite with the technical analysis theory. While RWH says that successive price changes are independent, the technical analysis supports that they are dependent. Likewise, the fundamental analysis theory holds that the value of share is simply the present value of all the future income which the owner of the share will receive (Francis, 1991). In an uncertain world, however the intrinsic value of a security cannot be determined exactly. The basic ideas behind the RWH are the successive price changes are uncorrelated over the time and its actual price moves randomly about its intrinsic value.

- **Lack of Appropriate Policy for Development of Nepalese Stock Market**

Nepalese stock market is in early stage of development, and the problem of the Nepalese Stock Market have not been diagnosed and identified. The policy makers are unable to make the appropriate policy for the development of the stock market.

- **Immature Stage of Stock Market**

Since, the stock market in Nepal is the most sufferers of problems and is operating in an immature stage. Some of the major problems that have severe impact on the stock market and the economy as a whole are: existing economic imbalances, ineffective implementation of economic policies and political instability. However, there has been continuous increased to the number of listed companies. The stock of the financial institutions play crucial role to extend the growth rate of economic development of the nation.

- **Deficiency in the Profitability and Good Governance**

The major causes of the deficiencies in Nepalese stock market appeared to be the profitability and the good governance of the company, government policy regarding investment, market operation system, investors' knowledge regarding information disclosures and inefficiency of the market. Despite these facts, market makers involved in the securities market are unable to exhibit the well performance according to the expectations of the investors. It is very difficult to examine all these avenues of the stock market.

Thus, this study has been carried out to analyze the market share prices of Nepalese Stock market in relation availability of arbitrage profit opportunities and to provide recommendation for the improvement. To sum up, the study would deal with the following issues:

- Whether there exist arbitrage profits in stock prices of commercial banks in Nepal or not?
- What is the behavior of commercial banks' price index and NEPSE index?
- Is the Nepalese stock market efficient in pricing shares?

1.3 Objectives of the Study

Within the periphery of the stated problem of the study, the broad objective of the study would be to analyze and assess the possibility of arbitrage profits (behavior of stock prices) of the sampled commercial banks operating in the present context of the country. The study proposes to test the hypothesis of the share price movements. However, the specific objectives of the study would be as follows:

- To analyze the existence of arbitrage profits in the stock prices of the commercial banks operating in the present context of Nepal.
- To analyze the behavior of those commercial banks index and NEPSE index.
- To determine whether the present Nepalese stock market is efficient in pricing shares.
- To outline the possible implications and also to recommend for the betterment of stock market.

1.4 Significance of the Study

The main reason behind this study would be to study arbitrage profits in Nepalese stock market by analyzing the stock price behavior and/or market efficiency of stock price of commercial banks. This study will benefit the prospective investors to gain the information regarding the stocks of commercial banks and to make the better investment decisions. As well as the investors can gain the information about the position of Nepalese stock market during the study period. Besides, this study will contribute to the concerned authorities and the market makers for making prudent decisions. Further, it will add little worth to those who wants to conduct a research work in related topic.

1.5 Limitation of the Study

This study has been conducted to represent the partial fulfillment of MBS level and this research has been completed and submitted within a time constraint, this study will be limited by the following factors:

- The data problem is acute in Nepal. Even the financial statements of listed companies published by Nepal Stock Exchange are not readily available since they are treated as confidential.
- Since the data covers only a certain period i.e. 5 years, the findings may not be a complete picture of the Nepalese stock market.

- The other limitations are time constraints, resource constraints, and lack of research experience.
- The major portions of analysis and interpretation would be done on the basis of the available data and information. So the consistency of finding and conclusion would be strictly dependent upon the reliability of secondary data and information.
- The data would be collected from NEPSE for its official records and the data are not verified.

1.6 Organization of the Study

Entire thesis has been organized into five parts, each devoted to some aspects of the study of stock price behavior. The titles of each part are as follows:

Chapter -I: Introduction

Chapter –II: Literature Review

Chapter- III: Research Methodology

Chapter- IV: Data presentation and Analysis

Chapter-V: Summary, Conclusion and Recommendations.

The rationale behind this kind of organization is to follow a simple research methodology approach. The content of each part of this study are briefly mentioned here.

The first chapter introduction describes background of the study, statement of the problem, the major issues to be investigated along with the objectives and scope of the study, limitation of the study and ends with the organization of the study.

The second chapter is devoted to review of related literature. It tries to define the concept of security market, stock prices, arbitrage profits and conceptual theories of stock price behavior. This chapter reviews the literature both from foreign context and Nepalese context, highlighting the major contributions of different studies like international journals, Masters Dissertations and Nepalese journals.

The third chapter, Research Methodology, discusses the methodologies used in the study. It deals with research design, sources and nature of data, sampling and population, test model and method of analysis as test methodology and definition of key terms.

The fourth chapter, Data presentation and analysis present statistical analysis of stock price behavior and include analysis of NEPSE and commercial Banks indices.

The last chapter of the study is Summary, Conclusion and Recommendations. It includes summary of the study, findings, conclusion drawn from the findings and the recommendation to the concerned authorities, companies, investors and forthcoming researchers for improving the future performance of the sample banks. Finally, bibliography and appendices are also presented at the end of the thesis work.

CHAPTER - II

LITERATURE REVIEW

In this chapter, reviews have been made on some of the basic literatures on arbitrage pricing theory and share price behavior. This chapter will not attempt to develop such theories but will make efforts to lay down certain decision rules that can be of some value in assessing the stock price behavior. This chapter is divided into two sub headings: conceptual review and research review. Conceptual review covers the concept of basic terms and various theories used in the study and research review includes the reviews of international journals, Masters Dissertation and Nepalese journals.

2.1 Conceptual Review

This part covers the theoretical concept of securities, securities market with its classification and security analysis. It concludes with the explanation of Nepalese securities market as well as the foreign context and its classification.

2.1.1 Concept of Securities

Securities are the financial assets that form the part of the investors' wealth. They are the marketable interests represented by the certificate as a financial value. They include shares of corporate stock or mutual funds, bond issued by the corporations or governmental agencies, stock options or other options, other derivative securities, limited partnership units and various other formal investment instruments.

A corporation may conveniently issue each class of securities in the market. There is a different class of investors for each class of securities because of their varying risk preference, income and control. The different types of buyers include: stock holders, employers, customers and creditors of the corporation and traders in the capital market (Kulkarni, 1992). The largest number of security buyers is the individual investors who seek safety on their commitment and reasonable certainty of a moderate but regular income. The speculator seeks large profits, even though considerable risk may be involve in it.

When someone borrows money from a pawnbroker, the borrower must leave some item of value as a security. If the borrower fails to repay the loan (plus interest), the pawnbroker can sell the pawned item to recover the amount of the loan (plus interest) and perhaps make the profit. The terms of the agreements are recorded on pawn tickets. When a college student borrows money to buy a car, the lenders usually holds formal title to the car until the loan is repaid. In the event of default, the lender can repossess the car, and sell it to recover the costs. In this case, the official certificate of title, issued by the state, serves as the security for the loan. A person who borrows money for a vacation may sign a piece of paper promising repayment with interest.

The loan is unsecured in the sense that there is no collateral, meaning that no specific assets have been promised to the lender in the event of default. In such a situation, the lender would have to take the borrower to court to try to recover the amount of the loan. Only a piece of paper called a promissory note stands as evidence of such a loan. When a firm borrows money, it may or may not offer collateral. Some loans may be secured with specific pieces of property (building or equipment). Such loans are recorded by means of mortgage bonds, which indicate the terms of repayment and the particular assets pledged to the lender in the event of default. However, it is much more common for a corporation to simply pledge all of its assets, perhaps with some provision for the manner in which the division will take place in the event of default. Such a promise is known as a debenture bond.

Finally, a firm may promise a right to share in its profits in return for an investor's fund. Nothing is pledged and no irrevocable promises are made, the firm simply pledge whatever its directors deem reasonable from time to time. However, the investors are given the right to participate in the determination of who will be the member of the board of directors. This right protects the investors against serious malfeasance. A share of common stock, which can be sold to someone else, who will then be able to exercise that right, represents the investors' property right. The holder of common stock is said to be the owner of the corporation and can exercise the control over its operations through the board of directors.

In general, only a piece of paper represents the investors' right to certain prospects or property and the conditions under which she/he may exercise those rights. This piece of paper, saving on evidence of property rights is called the security. It may be transferred to other investors and with it will go all its rights and conditions. Thus, everything from pawn ticket to a share of common stock is the security. Hence, the term of security can be understood as a legal representation of the right to receive prospective future benefits under conditions. The primary task of security analysis is to identify arbitrage profits i.e. to identify misplaced securities by determining these prospective future benefits, the conditions under which they will be received and the likelihood of such conditions (Francis, 2002).

Briefly, securities are the intangible assets, represented by legal claims to some future benefits or future cash. They give the holder an ownership interest in the assets of the company as well these have value in exchange. Securities are the term used interchangeably as financial assets or financial instruments.

2.1.2 Security Market

Security market is a broad term embracing a number of markets in which securities are bought and sold. The securities traded in the securities market are share, bonds, debentures, bills, notes etc. therefore, security market is a mechanism for raising required funds by selling and buying these securities. The development of the securities market enables the efficient transformation of savings from the hand of surplus spending units to those of deficit spending ones who can use them productively with lower risk.

The growth of the US economy has been due in large part to the strength and efficiency of its security markets (Cheney and Moses, 64). The importance of an efficient broadly based security market for a country's economy is demonstrated by the fact that one of the top priorities of emerging eastern European countries is the establishment of security markets. In converting from centrally planned economy to a market based system, the eastern European countries are establishing an environment in which business can operate. This includes, creating a new framework of commercial law, setting up autonomous and decentralized system of wholesale and retail distribution, establishing a banking system and providing sources of debt and equity capital for business through efficiently operated security market.

Security market interchangeably known as the integral part of the capital market is in fact basis of the economy. The most effective use of idle and surplus resources can be brought into pro-active purpose only by means of market mechanism. This indicates the structural network of the savers and user group of funds presumably garnered for the long term financing but the formation of network originates via conversion process of saving into investment outlet. Thus the security market upholds the attempts particularly concerned with the collection and mobilization of savings. Saving meticulously diverted towards the regeneration activities, in essence of financialization and industrialization activities will result in the repercussion favorable to the economy as a whole (Khatiwada, 1998).

The security market can be defined as a mechanism for bringing together buyer and seller of financial assets to facilitate trading. Security market is classified into two: the market in which new securities are sold is called the primary market and the market in which the securities are resold is called secondary market. Brokers, dealers, and market makers create secondary market. Brokers bring buyer and seller together without themselves actually buying and selling does not take place; dealer sets price at which they themselves are ready to buy and sell (bid and ask price respectively). Broker and dealer come together in organized market of in stock exchange (Gitman 1994).

New York, London, Tokyo contain the largest securities market in the world-all are about equal in size (Francis, 2002). Trading goes on 24 hours in a day. Each market conducts trading differently, So that the securities market should be viewed as components of a global market.

Securities market can be classified by the maturity of the securities that are traded in the market and by the new securities being sold or already issued securities are being brought and sold. New issues are made in the primary market whereas securities owned by the investors are usually bought and sold through the secondary market.

- **Primary Market**

The primary market is that part of securities market that deals with the issuance of new securities. Companies, governments or public sector institutions can obtain funding through the sale of new stock or bond issue. The issue of new securities is commonly known as an Initial Public Offering (IPO). Issuers usually retain investment banks to assist them in finding buyers for these issues, and in many cases, to buy any remaining interests themselves. This arrangement is known as underwriting.

The issuance of securities in the primary market leads to direct transfer of money from the savers to the issuer of the securities. Thus, the primary market transfers the fund from savers to investors to make the capital available for the investment in building, equipment, and stock of necessary goods (Shrestha, 2004).

- **Secondary Market**

After the securities have been purchased in the primary market, they can be traded in the secondary market. The secondary market is an organized market to enable buyers and sellers to effect their transaction more quickly and cheaply. It is therefore important that the secondary market do not go to the original issuer but to the owner (sellers) of the securities. Once the investors have purchased the securities in the primary markets, they need to sell those securities. Without the liquidity of the secondary market, firms would have difficulty in raising funds for productive purposes in the primary market (Cheney and Moses, 10th edition).

As the stock exchange typically deals in existing securities rather than in new issues, its economic significance may be misunderstood. Because an increase in volume of securities trading in the stock market does not represent an increase in the economy's aggregate saving as every purchase of an existing security is exactly offset by the sale of the security. The availability of an efficient secondary market for securities is one of the most important factors including investors to acquire new issues of securities. The basic economic function is to provide marketability for long-term investments, thereby reducing the personal risk incurred by investors, broadening the supply of equity and long-term debt capital for the financing of business enterprise. Thus, the secondary market is vital to an efficient and modern securities market (Bhalla, 1993).

2.1.3 Growth of Nepalese Security Markets

Security means shares, bonds, stocks, debentures or government's debts securities, nation saving certificates, treasury bills etc, which are issued by industrial organizations or organized institutions. Hence, security market refers to that market where buyers and sellers meet at a stated place.

The history of capital market in Nepal is very new. The concept of capital market was developed in 1976 by the establishment of Security Exchange Center (SEC). The number of listed companies and their trading was very negligible until the His Majesty Government (HMG) of Nepal has made economic reforms along with broad financial policy in 1993. The SEC is only the organization that is responsible for selling and buying securities in Nepal. It was established with the objectives of facilitating and promoting the growth of capital markets in Nepal. It was the only capital markets institutions undertaking the job of brokering, underwriting, managing public issue, market making for government bonds and other financial services. So it was both primary and secondary market as well.

The remarkable changes came only after the initiation to reform of the market in 1993, when SEC was converted into the Nepal Stock Exchange Ltd. (NEPSE). New market mechanism was introduced, which provided membership to market intermediaries and allowed to participate in the transaction of securities. Then the government established Securities Board of Nepal (SEBO/N) as an apex regulatory body under the Security Exchange Act, 1983 (second amendment) to regulate and monitor both the markets in 1997.

The history of securities market began with the floatation of shares by Biratnagar Jute Mills Ltd. and Nepal Bank Ltd. in 1937. Introduction of the Company Act in 1964, the first issuance of Government Bond in 1964 and the establishment of Securities Exchange Center Ltd. in 1976 were other significant developments relating to capital markets. The basic objective of NEPSE is to impart free marketability and liquidity to the government and the corporate securities by facilitating transactions through members, market intermediaries, such as brokers, market makers etc. NEPSE opened its trading floor on 13th January 1994 and till date has reached to automated trading and preparation for Central Depository System (CDS). The growth pattern of Nepalese Securities for the last five years is shown in table 2.1.

Table 2.1

Growth Pattern of Nepalese Securities Market from 2004/05 to 2008/09

(Rs in Million)

Year	Number of listed companies	Number of public issue	Amount Issued (Rs)	Paid up value (Rs)	Annual turnover	Market capitalization	NEPSE index
2004/05	125	14	1626.8	16771.9	4507.7	61365.9	286.67
2005/06	135	29	2443.3	19958.0	3415.4	96763.7	386.83
2006/07	135	34	2295.5	21746.0	8360.1	186301.3	683.95
2007/08	142	23	8799.3	29465.0	22820.76	266247.6	963.36
2008/09	149	23	23287.5	61140.0	21681.14	512939.0	749.1

Sources: SEBO/N Annual report 2008/2009

Table 2.1 shows the growth pattern of Nepalese stock market. The total market scenario can be learned from the above table regarding the number of listed companies, number of public issue and so on.

2.1.4 Role of Stock Exchange

Stock exchange is the market where second hand securities are bought and sold for investment or speculative purposes. It provides facilities for trading in listed securities. In recent years the role of stock exchange is being increasingly recognized by the authorities (Mahat, 1981). Stock exchange as the market for securities gives access to a number of different opportunities for as many buyers and sellers of securities as possible. From a general economic point of view, the stock exchange constitutes the core of capital market.

Investment is the lifeblood of economic development. It is evident that stock exchange will continue to fulfill their vital function in the national economy. So long as private enterprise exists, we know that the stock exchange is the place where stock and shares are bought and sold.

The substantial competition in innumerable buyers and sellers determines the prices with a measure of precision that cannot be obtained in other unorganized market to such as the property market where activity are of spasmodic nature. Investors wanted liquidity - the facility to convert their investment into cash at any given time - and answer was a market for investments. This was how the stock exchange cares into being.

This institution plays a notable role in the economic life of the country acting as a free market for securities, where prices are determined by the forces of supply and demand. The function of stock exchange is not only to provide a market for securities but also to raise funds for government and industry. Thus, a free and active market in stock and share has become a prerequisite for the mobilization and distribution of a nation's saving so as to support modern business (Mahat, 1981).

In this way, we can say that stock exchange have a vital role to play in helping industries to raise necessary finance. They have a supremacy function to perform in developing a stock capital and to enable government to raise loans. It is generally thought that a stock exchange serves only those who have money to invest and securities to sell. This is an understatement for a stock exchange; rather it benefits the whole community in many ways-direct and indirect. By enabling producers to raise capacity it indirectly gives employment to the millions of people and helps consumers to get goods needed by them.

2.1.5 Theories of Share Price Behavior

There are numerous reasons that cause the share price movements. Mainly they are economic and non-economic factors. The price of securities is typically very sensitive, responsive to all events, both real and imagined, that cast light into the murky future (Cootner, 1962). Although all factors give rise to observed movement of share prices, it would be very hard to find a completely accepted price formation theory. Before describing the Efficient Market Theory, it would be proper to explain the first two conventional theories, viz; Technical Analysis Theory and Fundamental Analysis Theory.

- **Technical Analysis Theory**

The word technical implies a study of the market itself and not of those external factors, which are reflected in the market. In simple term, "Technical Analysis" is a general term for a number of investigating techniques that attempt to forecast securities prices by studying past prices and related statistics. Charles Dow is the greatest protagonist of this theory. The technicians usually attempt to predict the term price movements and thus make recommendation concerning the timing of purchase and sales of either specific stock or group of stocks in general. However a large part of the methodology of technical analysis lacks a strictly logical explanation. Technical analysis is useful for timing a buy or sell order. Investors put off to buy a share if technicians predict that stock prices are further dropping in future. Conversely, investors postpone the selling order if technicians predict that prices further are increasing in near future.

- **Fundamental Analysis Theory**

Fundamental analysis approach involves working to analyze different factors such as economic influences, industry factors, governmental actions, firms financial statements, its competitors and pertinent company information like product demand, earnings, dividends in order to calculate an intrinsic value for firms securities. Analysts, who believe that fundamental facts determine intrinsic value of the stock, are popularly known as fundamentalist.

Fundamentalists forecast stock price on the basis of economic industry and company statistic. The principal decision variables ultimately take form of earning and value with a risk-returns framework based upon earning power and the economic environment. Fundamental analysts delve into company's earnings, their management, economic outlook, firm's competitors, market condition and many other factors (Francis, 1991).

The objective of fundamentalist is to appraise the intrinsic value of a security. The fundamentalist maintain that any point of time every stock has an intrinsic value (true economic work of financial assets) which should in principle be equal to the present value of the future stream of income from the stock discounted at an appropriated risk related to the rate of interest.

The study of fundamentalist involves examining its sales earnings, profit margins, dividends, management proficiency, industrial and business outlook, labor competence, and any factor that would have a bearing on its performance in its future. On the basis of such study, fundamentalists project a company's future profits and earning capacity with reasonable accuracy what the price of company's share ought to be. The estimated price is termed as the intrinsic value, which is generally away from the present market value.

Thus, there is a gap between them. Fundamentalist reaches to an investment decision by comparing this value with current market value; it is believed that price will rise. In this situation, fundamentalist will acquire the share as the difference presents them with an opportunity to make a profit. Alternatively, in case of low intrinsic value the share is considered to be overpriced and fundamentalist sell the share believing that the market is inefficient in pricing shares.

- **Efficient Market Theory**

An efficient market is one where shares are correctly priced. An efficient financial market exists when a security price reflects all available public information about economic, financial markets and all about the specific company involved (Van Horne, 1998). An efficient capital market is one in which it is impossible to earn abnormal return by trading on the basis of publicly available information.

An initial and very important premise of an efficient market is that there are large numbers of knowledgeable and profit maximizing independent buyers and sellers, new information is generated randomly and the investors adjust the information rapidly (Reilly, 1986).

2.2 Research Review

This section discusses about the review of international journals, Masters Dissertations and Nepalese Journals. The journals have been browsed through websites whereas the Masters dissertations have been reviewed through libraries.

2.2.1 Review of Foreign Context

All the empirical work on efficient market hypothesis can be considered within the context of the expected return on “fair game” model. Indeed in the early literature, discussion of the efficient market hypothesis were phrased in terms of the even more special random walk model though most of the early authors were in the fact concerned with more general version of the “Fair Game” model. There are large numbers of studies and few of them are briefly reviewed below.

Fama’s (1965) study on random walk model was considered to be one of the most definitive studies. He analyzed the daily proportionate price changes of 30 blue chip stocks in the DJIJ for the period of late 1957 to 26th September 1962. He followed standard statistical tools such as serial correlation and run tests to examine whether any dependency exists in any lag price change. He found that the serial correlation coefficient for daily price change were very small and average was 0.03,which is close to zero, but the correlation coefficient of 11 stocks out of 30 were more than twice of their computed standard errors. He used serial correlation coefficient for differentiating intervals stronger evidence of dependence. It led Fama to conclude that the evidence produced by the serial correlation model seems to indicate that dependence in successive price changes is either extremely, slight or non-existence (Fama, 1965).

Fama further examined using run test analysis to testify whether price changes were likely to be followed by more price changes in the same time. In fact, he found that the actual and expected runs are not significantly different. The largest difference exists for daily changes, but the different was not significant. However, the difference for the 4-day, 9-day and 16-day interval was very small and the departure from Random Walk Hypothesis was negligible and Fama concluded that there was little evidence, either from serial correlation or run test of any large degree of dependence in the daily 4-day,9-day and 16-day price changes (Fama, 1965).

Conard and Juttner (1973), applied runs and serial correlation test to examine the daily prices of 54 German stocks and observer dependence in the successive price changes. Thus, they concluded that the random walk theory is inappropriate to describe the behavior of share price in Germany (Conard and Junter, 1973).

Rao and Mukherjee (1979), applied spectral method to test random walk model of share price behavior by using spectral analysis. They examined weekly average share price of Aluminum Company's share for the sixteen years from 1954 to 1970 and eventually their study supported the random walk hypothesis (Rao and Mukherji, 1979).

Mahapatra (1995) tested the EMH using rank correlation analysis based on relative strength. His sample consisted of month-end closing price of 26 stocks from Bombay stock Exchange between the periods of January 1989 to December 1992. He found that the Indian stock market is less efficient in the short run, but more efficient in the long run (Mahapatra, 1995).

Dorner (2005) conducted a research by using a computer-based content analysis of qualitative data. He took the data from a Swedish real estate firm during the period 1991-1996. The main objective was to examine the response of stock price to financial announcement. He found the positive correlation between the stock price and the following information categories: net assets value, occupancy rates, cash flow and overall capitalization rate. The main contribution of the study was to support the assumption that public financial information has an impact on stock market behavior (Dorner, 2005).

Doctors Stephen Ross and Richard Roll employed factor analytic techniques to analyze 12060 NYSE stocks that were divided into 42 groups of 30 stocks. They analyses daily stocks price returns over a decade. In the first step of their study, R & R estimated the factors loading. For their second step, they ran a separate cross-sectional multiple regression for each of the 42 group of stocks. The cross-sectional regression coefficient λj for the *j*th factor loading is an empirical estimate of that factors risk premium. One or more of these regression coefficients should be statistically significantly different from zero is the APT is to be substantiated. The R&R study concluded that it was most likely that there were four or fewer important factors.

Chen, Roll, and Ross (CRR) isolated four factors that significantly influenced securities returns. These factors represented changes in the following four variables.

1. Unanticipated changes in the rate of inflation.
2. Unanticipated changes in the index of industrial production.
3. Unanticipated changes in the yield spread between high-grade and low-grade corporate bonds.
4. Unanticipated changes in the slope of the term structure of interest rates, as measured by the difference between the yields on long-term government bonds and T-bills

CRR's dineation of these factors corresponds with dividend discount models. The first two factors affect the income and the last two factors affect the discount rate of the present value of the future cash dividends model.

Professor Chen conducted a series of insightful empirical tests of APT. He compared the empirical characteristics of APT with the CAPM using daily stock returns from 1963 to 1978. First, cross-sectional regressions of the historical average returns from the sampled stocks were related to the APT and CAPM. The sensitivity measure on the first factor has the highest statistical significance. Therefore, it was noteworthy that the simple correlation coefficient between bi and bi1 was found to be high and positive (in excess of 0.9) regardless of the market index used to estimate the betas bi. This finding suggests that the first risk factor may somewhat resemble the market portfolio. In addition, the hypothesis that $\lambda 2 = \lambda 3 = \ldots \lambda k = 0$ was rejected. This suggest that more than one risk factor should be considered. Chen conducted a second test using cross-sectional regression equation that relates the historical average return from the ith stock to a weighted average of the stock's average return. Various estimates produced values of k that were in excess of 0.9; this finding implies that APT predicts average returns better than the CAPM.

Chen also formulated a third test that employed cross-sectional regression equation designed to detect unused information about stock's expected returns that turned up as residue in the random error terms ei and zi. The tests were based on the idea that if a particular model was valid, its random error term should be white noise-the residuals should contain no additional information. Chen reported that the CAPM appeared to be econometrically misspecified in most cases. The APT model was able to explain some of the CAPM's unexplained residual returns. In contrast, the CAPM was unable to explain anything about the error terms from the APT model. Chen formulated two additional tests based on empirical anomalies in the CAPM that can be interpreted as evidence against it. The tests were designed to see if (1) the total variance of a stock's returns or (2) the size of the issuing firm were crosssectionally related to the stocks average return after removing that part of the return that was explained by the APT model. The results indicated that neither the firms' variances nor the firms' sizes had significant explanatory power over the unexplained residual return left by the APT. This is another shred of evidence in support of APT (Francis, J.K., 1991).

The review of the above mentioned studies carried out in foreign countries shows many interesting findings on share price behavior. However the question arises as to what extent these findings are pertinent for the context of Nepal? They all may not be applicable for Nepalese stock market where stock market is small and underdeveloped.

2.2.2 Review of Related Studies in Nepal

There are many researches carried out by different researchers in this topic in Nepal. Here are some of the past related studies conducted which can help us to understand about their objectives, used statistical tools and major findings about the stock price behavior in Nepal.

Gurung (December 2004) has conducted the study on Growth and performance of securities market. The variables such as number of listed and traded companies, their securities, number of transactions, trading turnovers, paid up value, market capitalization and NEPSE index. They are analyzed to know the growth trend and the performance of Nepalese securities market. The study revealed the growth and performance of Nepalese securities market are not satisfactory even after the introduction of new mechanism in 1993/1994 though it is improving gradually.

Pradhan and Upadhyay (January 2004) have tested the efficient market hypothesis in context of Nepal. The core objective of the study was to make the comprehensive investigation of weak and other form of EMH. In other to be conclusive about the efficiency of the stock market, primary sources of information about the share price was collected for the first time to find out more subjective facts on share price behavior, which could not be determined using secondary data. Statistical tools like serial correlation, run test, weighted mean, median, chi-square test, and spearman's rank correlation were used. The twenty-three stocks actively traded were examined as a sample for the study from mid July 1997 to mid July 2000.

Shrestha (Summer 1992) has the studied on Capital Market in Nepal. He has attempted to highlight mainly on three aspects: conceptual rationale of the capital market, achievement of the Nepalese capital market and the possible scenarios to improve the performance of the capital market in Nepal. For this he has examined the 14 listed companies and his study concluded that the various inconsistencies and hindrances do exist in the smooth functioning of capital market. Likewise, it is necessary to identify national talent, and put committed and dedicated professionals with additional background of knowledge and experience in the decision-making capacity of SEC.

Pradhan (1993) has conducted a study on Stock Market Behavior in a small capital market by collecting the data of 17 enterprises from 1986-1990. He has applied Market Equity, Market Value to Book Value, Price Earning and Dividend as the technical tools for analysis of data. His findings have indicated that larger stocks have larger price earning ratios, larger ratios of market value to book value of equity, lower liquidity, lower profitability and smaller dividends. Price earning ratios and dividend ratios are more variable for smaller stocks where as market value to book value is more variable for larger stocks.

Larger stocks also have higher leverage, lower assets turnover, and lower interest coverage but these are more variable for smaller stocks than for larger stocks. Stocks with larger market value to book value of equity have larger price-earning ratios, and lower dividends. These stocks also have lower liquidity, higher leverage, lower earnings, lower turnover and lower interest coverage. The study has concluded that there is a positive relation between the ratio of dividend per share and interest coverage.

2.2.3 Review of Unpublished Masters Dissertations

Poudel (2001) studied on share price movement of joint venture commercial banks by using various financial and statistical tools like standard deviation, correlation, beta and t-tests, which concluded that Nepal stock exchange operates in a weak form of efficient market hypothesis, indicating that the market price move randomly. The market value per share does not accommodate all the available historical information. The shares of joint venture commercial banks emerge as a blue chip in the Nepalese stock market. The beta coefficient, which measures the riskiness of individual security in relative term, suggests that none of the share of eight sampled banks were risky.

Poudel (2002) carried study on Share Price Behavior of Joint Venture Banks in Nepal. He concluded that the growth rate analysis as a stand-alone may not be adequate for the analysis of share prices behavior and may not represent the banks performance in the secondary market. The ordinary least square equation of the book value per share on market value per share reveals that the independent variable does not fully explain the dependent variable. Nepal Stock Exchange operates in the weak form of EMH, including the market price move randomly. The market value per share does not accommodate all the available historical information. The potential market investors buy the shares of the joint venture commercial banks as these shares have good record of financial accomplishment. Thus the shares of these banks emerge as a blue chip in the Nepalese Stock Market (NSM).

Poudel (2003) studied on the movement of stock price of Joint Venture commercial banks and found that generally banking sectors NEPSE Index has dominated all the other sectors. The movement of the stock prices is dependent to historical prices. The stocks of all the sampled companies are under-priced since their expected rate of return is higher than the respective required rate of return.

Gautam (2004) carried a study on stock market behavior. The study concluded that political instability and other laws related issues are the prominent factors for the underdevelopment of security market in Nepal. She further concluded that the stockbrokers and the stock market are not being much active to create investment environment in the stock market. Information deficiency in the capital market is one of the reasons for determination of share price by excessive speculation. The available information is of low quality and people have very little knowledge of the trading procedure and price formation mechanism in the NEPSE. Lack of effective laws and implication of the existing laws are the contributing factors for the less development of capital market. She further highlighted other the major problems of stock market being poor regulatory controls and supervisions by SEBON & NEPSE.

Poudel (2005) studied on Stock Price Behavior of Commercial Banks in NEPSE with the objectives of examining monthly closing price of 6 listed commercial banks during the period of three consecutives years from 2002-2004.The researcher used correlation coefficient, regression analysis, run test and auto correlation. He found that successive price changes were correlated with previous price series. He also found that most of the stocks do not follow

Random Walk Hypothesis. The present stock prices were dependent to the historical prices. Most of the investors wanted to invest in the commercial banks and the fluctuation in the NEPSE index was due to the transaction of commercial banks. It further found that the monthly closing price is not enough to predict the stock prices.

Thapa (2006) has studied the behavior of Nepal Stock Exchange (NSE) index on Behavior of Nepal Stock Exchange Index. The study endeavors to examine the efficiency of the behavior of NEPSE index. It covers the period of five years from 2000-2005 by considering all the sectors. Conclusion says that the growth of the capital market is in slow pace. Banks and finance companies are in better position. NEPSE Index shows no sign of improvement and reflects the aggregate volatility of the share prices of the listed companies.

Bhattarai (2007) conducted the study on Stock Price Behavior of commercial Banks in Nepal with the objective to analyze the behavior of NEPSE index and the factors that impact on stock price. The behavior of NEPSE index were identified by taking the closing point of sampled banks, and various financial tools like EPS, DPS, BVPS etc as well as correlation analysis were used. Survey shows that beside the factors: position of the company, earning, dividend etc., share price is also affected by financial report publication, liquidity position in market, demand and supply of shares, and other environmental factors.

Shrestha (2008) has completed the study on “An analysis on the factors of volatility of share price in Nepalese Stock Market” with the objective to analyze the share price volatility factors with different listed companies in NEPSE. Financial as well as the statistical tools were used by the researcher in analyzing and drawing the conclusion from the collected data. However this study concludes that there are various factors in the stock market, which is responsible in the fluctuation of the share price in Nepalese share market.

2.3 Research Gap

Very few studies have been conducted in the field of share price behavior. The government policy to reform capital market under the extended structural program (ESAP) and modern system of open-cry-cut in F/Y 1993/94 had significantly positive impact on stock market development. After the restoration of democracy, the government has launched liberalization policy, which has built the expectation for the establishment of multinational companies. But unfortunately, because of lack of proper implementation stock market development seems useless. Various studies have been conducted related to share price considering it as a crucial phenomenon in the stock market. New laws are being established to control stock market price. But it is clearly realized that share price are fluctuating abnormally and there is lack of appropriate researches to find out the volatility of share price of commercial banks in the stock market and the resultant impact on arbitrage profits.

Present study tries to analyze the stock price behavior of commercial banks to find out the existence of arbitrage profits by applying various tools. The present study will be fruitful to the interested person in academic as well as in policy level. Hope this study will help others in future in the related field.

CHAPTER - III

RESEARCH METHODOLOGY

Research is an effort to search new fact, knowledge and principle in an effort to search new fact, knowledge. A systematic research study requires a proper methodology to achieve the set objective. Research methodology is a systematic method of finding solution of a problem which involves collection, recording, analysis, interpretation and reporting of data and information. In other words, research methodology describes the methods and process applied in the entire aspect of the study. “Research Methodology” refers to the various sequential steps (along with a rationale, of each step) to be adopted by researcher in studying a problem with certain objects in view (Kothari, 1994). It indicates the methods and the processes employed in the entire aspects of the study. In order to achieve the objectives of the study the following research methodology has been applied.

This study is based on primary as well as secondary sources of information. Secondary source of information has been used to test the random walk hypothesis by means of (i) a parametric test for independence and (ii) a non parametric test for randomness. While the basic purpose of primary sources of information analysis is to survey the opinions of the financial executives on share price behavior. This chapter describes the following aspects of research methodology.

1. Research design
2. Population and sample
3. Nature and Sources of data
4. Data collection techniques
5. Data analysis tools

3.1 Research Design

The research design refers to the entire process of planning and carrying out a research study. This study is carried out to get the empirical result of the stock price behavior. To conduct the study, analytical and descriptive research approach is adopted for the historical data and information. Descriptive design has been adopted to analyze the behavior of daily stock price behavior of the sampled banks, NEPSE index and commercial bank index. At the same time, analytical design has been applied to identify the independence and the randomness of the successive stock prices further, it interprets the empirical results.

3.2 Population and Sample

There are altogether twenty nine commercial banks operating in Nepal, but among them 24 commercial banks are listed as per the data available on the website of Nepal Rastra Bank (NRB) and SEBO/N. Out of these, 24 commercial banks are regarded as population and among those 5 commercial banks were sampled randomly.

3.3 Nature and Sources of Data

Secondary source is the major source of data in this research. However, the study has also been supported by primary data. The required data has been collected from annual trading report of NEPSE 2008/09, national dailies: Kantipur, The Himalayan Times, Gorkhaptra and The Rising Nepal and also the required data were downloaded from www.bm.com.np, an official website of Business Manager and www.nepalstock.com, an official site of NEPSE. Previous studies and reports (Master's Dissertation), published and unpublished official records (concerned bank's annual report & Nepse annual reports) have also been of great help while doing the research work. And the researchers have also visited the office of SEBO/N in Thapathali and NEPSE in

Singh durbar plaza Kathmandu. This study covers the observations of one fiscal year (July 16, 2008 to July 16, 2009)

3.4 Data Analysis Tools

In this study, statistical as well as financial tools have been used to analyze the data. Statistical tools are to function as a tool in designing research, analyzing its data and drawing conclusion. Statistics is the science, which deals with classification and tabulation of numerical facts as the basis of explanation description and comparison of phenomenon. The various statistical as well as financial tools are presented below:

3.4.1 Statistical Tools

- **Arithmetic Mean**

The most common method, generally referred to the average is the arithmetic mean. In descriptive statistics, the arithmetic mean is the average of set of values or distribution.

The most popular and widely used measure of representing the entire data by one value is what most laymen call an average and what the statisticians call the Arithmetic mean (Gupta, 2000) for a data set, the mean is just the sum of all the observations divided by the number of observations.

Symbolically,

$$\mu \; X \frac{X}{N}$$

Where,

μ = the population means variable 'X'

X = sum of all the observed value of 'X' variable

N = the total number of observations

Standard Deviation

The standard deviation (SD) of a probability distribution, random variable or population or multi-set of values is defined as the square root of the variance. The standard deviation measures the absolute dispersion. Higher the standard deviation the greater will be the magnitude of the deviation. Lower standard deviation means a high degree of uniformity of the observation as well as homogeneity of a series and a large standard deviation means just the opposite. Standard deviation is extremely useful in judging the representativeness of the means (Gupta, 2000).

Symbolically,

$$\pm = \sqrt{\frac{(X\ Z\mu)^2}{N}}$$

Where,

± = Standard deviation

X = Observation

« = population mean for observed value of 'X'

N = total number of observations

= sum of all values of (X- «)^2

Coefficient of Variation

The coefficient of variation (CV) is the measure of dispersion of a probability distribution in probability theory and statistics. It is defined as the ratio of the SD to mean. It is dimensionless number that allows comparison of the variation of populations that have significantly different mean values. The CV of the exponential distribution is often more important than the normal distribution. The CV of an exponential distribution is equal to its mean, so its CV is equal to 1. Distribution with CV<1 are considered low-variance, while those with CV>1 are considered high-variance.

Symbolically,

$$CV = \frac{\sigma}{\mu} | 100\%$$

Where,

± =SD of population

« =Population Mean

Regression

Regression analysis means the estimation or prediction of the unknown values of variable. It is a mathematical measure of the average relationship between two or more variables in terms of the original units of data. In regression analysis, there are two types of variables. The variable whose value is influenced or is to be predicted is called dependent variable and the variable, which influences the values or is used for prediction is called the independent variable.

Simple Regression

The line of regression of X on Y is the line which gives the best estimates of X for any given amount of Y. the simple regression can be expressed as:

Y (dependent variable) = a (constant) + $b_1 \times X_1$ (independent variable) + E (error)

Where, b_1=Beta

Multiple Regressions

The multiple regressions can be expressed as:

Y (dependent variable) = a (constant) + $b_1X_1 + b_2X_2 + b_3X_3$ + E (error)

Where, X_1, X_2 and X_3 are independent variables.

Coefficient of Regression

The coefficient ‘b’ which is the slope of regression of Y on X is called the coefficient of regression of Y on X. it represents the increment in the value of the dependent variable Y for a unit change in the value of the independent variable X. in other words, it represents the rate of change. The convenient way to calculate the value of ‘b’ is as follows:

Symbolically,

$$'b'X\frac{n \quad xy\,Z \quad x \quad y}{n \quad x^{2}\,Z(\quad x)^{2}}$$

Where,

x = sum of all the observed value of 'X' variable

y = sum of all the observed value of 'X' variable

$x \quad y$ = sum of all the observed value of 'X' variable and 'Y' variable

$(\quad x)^{2}$ = sum of the square of observed value of 'X' variable

n = number of the sampled variable.

- **Standard Error of Estimates**

A measure of the estimates so obtained from regression equation is provided by standard error of the estimates (S.E.E.). Standard error is a word analogous to standard deviation, which is a measure of dispersion of observation about the mean of the distribution and gives us a measure of the scatter ness of the observations about the line of regression.

3.4.2 Test Model

The daily closing price of each stock has been selected for analysis of share price behavior. The actual tests of autocorrelation were not performed on the daily prices themselves but on the first differences of their natural logarithms. The variable of this study is: (Fama, 1965).

$$R_{j,t}\,t\,XLn\frac{P_{i,j}}{P_{j,(tZ1)}}$$

$$XLn(P_{j,t})\,ZLn[P_{j(tZ1)}]\text{........................}3.1$$

Where;

$R_{j.t}$ = Price Changes in natural logarithm of stock j

$P_{j,t}$ = Price of stock j. observed at the end of day t.

$P_{j(tZ1)}$ = Price of Stock j observed at the end of day t-1

j =1, 2, 3, 4, ………………..n

t =1, 2, 3, 4, ………………..n

L_n = natural log

It is preferable to analyze the data on the difference of lag prices rather than the raw prices. Because the changes in the log prices is the yield with continuous compounding from holding the security for that day (t) and the variability of the simple price changes for the given stock is probably the function of the price level (Fama, 1965).

There are three main reasons for using changes in log price rather than simple price changes (Fama, 1965). First, the changes in the log price are the yield, with continuous compounding, from holding the security for that day. Second, Moore (1962) has shown that the variability of simple price changes for a given stock is an increasing function of the price level of the stock. Third, for changes less stock (±) 15 percent the changes in log price is very close to the percentage price changes. Similarly, Roberts (Roberts, 1959) suggested that it is wiser to analyze changes of logarithms or square root of level. However, the other non-parametric test i.e. run tests have been performed on the arithmetic first differences.

3.4.3 Test Methodology

The method of analysis employed in this study includes the use of:

- Autocorrelation/ Serial Correlation
- Run Tests

- **Autocorrelation/ Serial Correlation**

Autocorrelation/ Serial correlation is one of the statistical tools used to measure dependence of successive number in series. It has been widely used to measure the possible dependence in successive share price change as well. In general, serial correlation coefficient measures the relationship between the values of a random variable in time (t) and its value of the (k) period earlier. It indicates whether the price change at time (t) is influenced by the price changes occurring (k) period earlier. (Pradhan, January 2004)

For the given time series, the auto correlation coefficient for lag k is;

$$r_k = \frac{\text{Covariance}(e_t, e_{t-1})}{\text{Variance}(e_t)} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 3.2$$

$$= \frac{\sum_{t=1}^{n} e_t . e_{t-1}}{\sum_{t=1}^{n} e_t^{2}}$$

$[\ldots \text{variance}(e_t . e_{t-1})]$

Where,

r_k =Auto correlation coefficient

e_t =Price changes in natural logarithm of given stock from the end of day $(t-1)$ to the end of day (t)

k=lagged variables (1, 2, 3…………………..n)

t= time variable (1, 2, 3…………………………n)

The result of autocorrelation always ranges between +1 and -1. If the computed coefficient of autocorrelation is near to zero, then it is an indication of independence, i.e. today's price is an unbiased outcome of yesterday's price. But if the computed value departs significantly from zero, either in positive or negative direction, it causes dependence among the time series data accordingly.

If the distribution of e_t has finite variance, then in very large samples the standard error of r_t is given by;

$$S.E(r_k)\ X\sqrt{\frac{1}{(N\ Z k)}} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots 3.3$$

Where,

$S.E.(r_k)$ = Standard Error of Auto correlation coefficient

N=Sample size

k= lag period

- **The Run Test Analysis**

Statistical tests based on the theory of runs ignore absolute values in the time series and observe only their signs. That is, they are essentially concerned with the direction of changes in a given time series. Thus for the present purpose, a run can be defined as a sequence of price changes of the same sign preceded and followed by price change of different sign. In a given share price change series, there are three types of price change in a series i.e. positive, negative, and no change, thus implying three types of runs. Therefore, a plus run of length I may be defined as the sequence of positive price changes preceded and succeeded by either negative or positive or zero price change (Fama, 1965). Likewise, a run of length I of minus and no-change sign can be defined as a sequence of I consecutive price changes of the same sign followed and preceded by negative and no-change sign of price changes. A run test is performed by comparing the actual number of runs with the expected number of runs on the assumptions that price changes are independent. If the actual (observed) runs are not significantly different from the expected number of runs then it is concluded that the successive price changes are independent. In contrast, if these differences were significant, the price changes would be dependent. Run test is the non- parametric test that ignores the magnitude of price changes and observes only direction of changes in a given time series. The difference between the expected and actual number of runs will be analyzed by the total number of runs.

- **Total Number of Runs**

Under the hypothesis of independence and on assumption that sample proportions of positive, negative and no-change are unbiased estimate of the population proportions, the population proportions, the expected number of runs of all types can be computed as follows: (Waills and Roberts,1956).

Symbolically,

$$M = \frac{N(N+1) - \sum_{i=1}^{3} n_i^2}{N} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots 3.4$$

Where,

M : Expected number of runs.

N : Total number of runs.

n_i : Number of price changes of each sign.

The standard error of M is;

$$\sigma_m = \left[\frac{\sum_{i=1}^{3} n_i^2 \left(\sum_{i=1}^{3} n_i^2 + N(N+1)\right) - 2N\sum_{i=1}^{3} n_i^3}{N^2(N-1)}\right]^{\frac{1}{2}} \quad \text{……………………….3.5}$$

For large N, the sampling distribution of the expected number of runs of all types is approximately normal with mean M and standard error (σm) as given by (3.4) and (3.5) respectively. Thus, the difference between the actual number of runs and the expected number of runs can be expressed by means of the usual standardized variable.

Symbolically,

$$Z = \frac{R + \frac{1}{2} - M}{\sigma_m} \quad \text{…………………………..….3.6}$$

Where,

R	=Total actual no of runs of all signs.
$\frac{1}{2}$	=Numerator of a discontinuity adjustment.
M	=Mean (Expected number of runs).
σ_m	=Standard error of sampling distribution of runs

For large sample, Z will be approximately normal with mean 0 and Variance 1. Therefore, for testing significance of the difference between actual and expected number of runs, the test statistic employed would be standardized to normal variate Z. the null hypothesis (i.e., randomness hypothesis) will be rejected or accepted at 5 percent and 1 percent level of significance in favor of (or against) the alternative hypothesis (non-random hypothesis) depending on observed values of Z. In addition, for comparison of actual and expected number of runs, the percentage of K will be employed as;

Symbolically,

$$K= \frac{(R\ ZM)}{M} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 3.7$$

Here, the term K, is defined as proportionate difference between actual and expected number of runs.

3.4.4 Hypothesis of the Study

The following hypothesis is set up in this study;

H_0 **:** The successive or lagged price changes are independent.

H_1 **:** The successive or lagged price changes are dependent.

Where,

H_0 =Null hypothesis

H_1 =Alternative hypothesis

Decision:

Decision can be made by comparing the calculated vale of Z with tabulated value of Z. If the calculated value of Z is less than equal to tabulated value of Z, it is not significant and H_0 is accepted. Otherwise, it is rejected.

3.5 Limitation of the Methodology

Like other studies, this study is not an exception regarding the limitations. Random sampling method itself is not free from biasness. Only equity shares of commercial banks are studied, though NEPSE has listed others company too. This study has covered he short period due to time constraints. In addition, NEPSE lacks the reliable system in keeping and disclosing data.

This has led difficulty in data collection process. Political instability has influenced the trading days of the stock market as well as to carry out the research work smoothly. Benefits of the study are limited to those who carry out the research work smoothly. Methods employed in this study may not be suitable to the other avenues of the Nepalese stock market.

CHAPTER - IV

DATA PRESENTATION AND ANALYSIS

This chapter presents the graphs of stock price behavior and volatility analysis of sampled stocks. Similarly it presents the comparative analysis of the commercial banks index and the NEPSE index. Furthermore, graph displaying daily co-movement of commercial bank index and the Nepse index has also been presented. Likewise, it imparts the detail of serial correlation analysis and run test analysis.

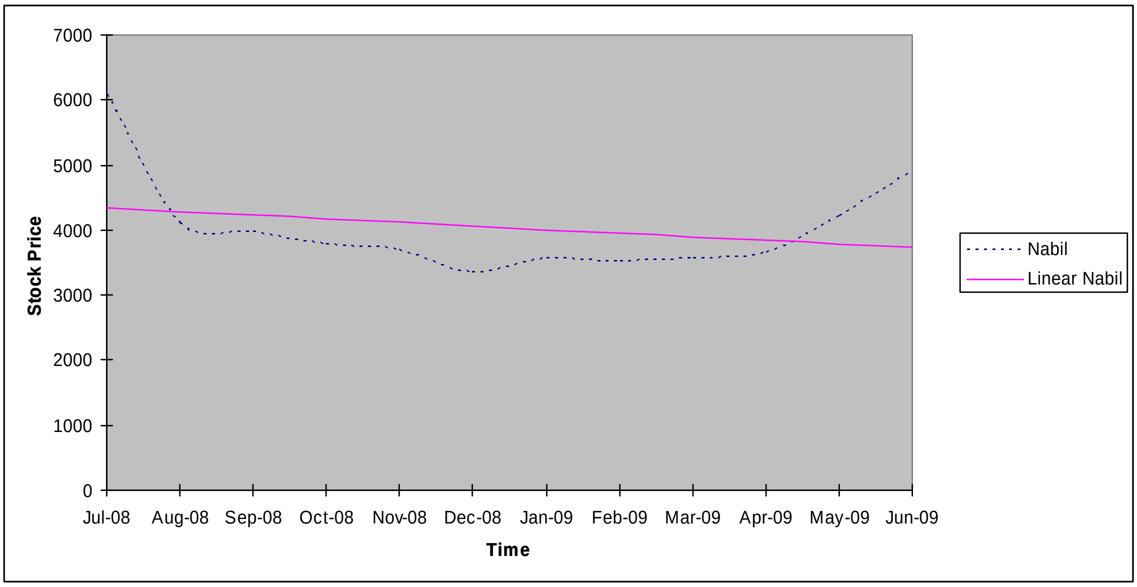
4.1 Data Presentation and Analysis

4.1.1 Stock Price Behavior of Sampled Commercial Banks

This part presents the individual graphs of sampled commercial banks. Graphs clearly exhibit the series of stock price behavior. The series represents the monthly data covering from July 17 2008 to July 16 2009. In the figures below dotted line represents the true price of share where as the other line represents linear line.

Figure 4.1

Stock Price Behavior of Nabil

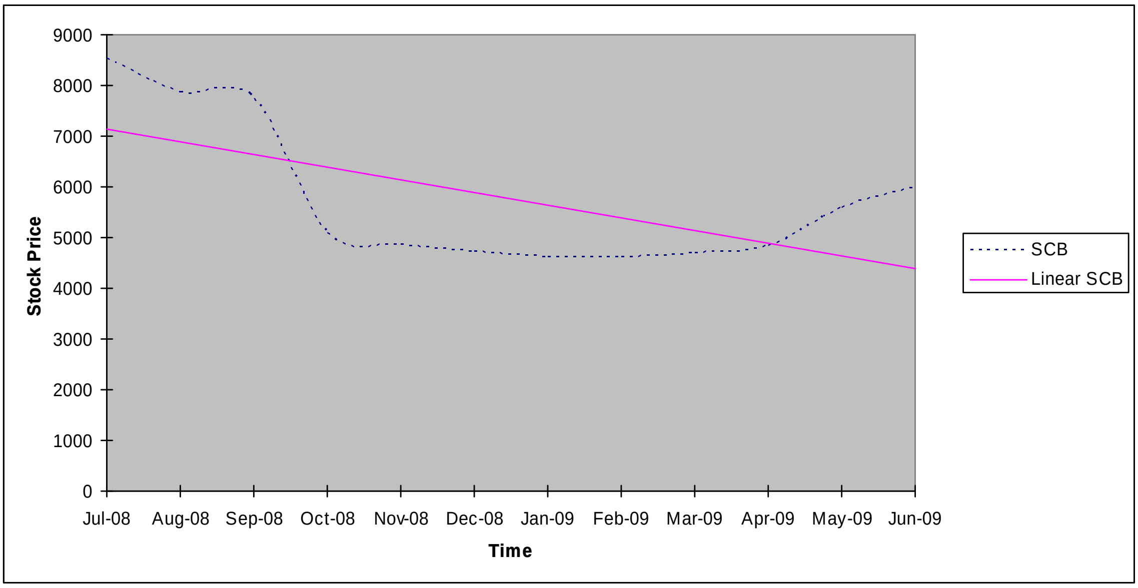


Source: Appendix-1

Figure 4.1 exhibits the stock price behavior of Nabil. The maximum price of Nabil is Rs 6101 in July 2008 and the minimum is Rs 3520 in February 2009 and the average price is Rs 4035.17.

Figure 4.2

Stock Price Behavior of SCB

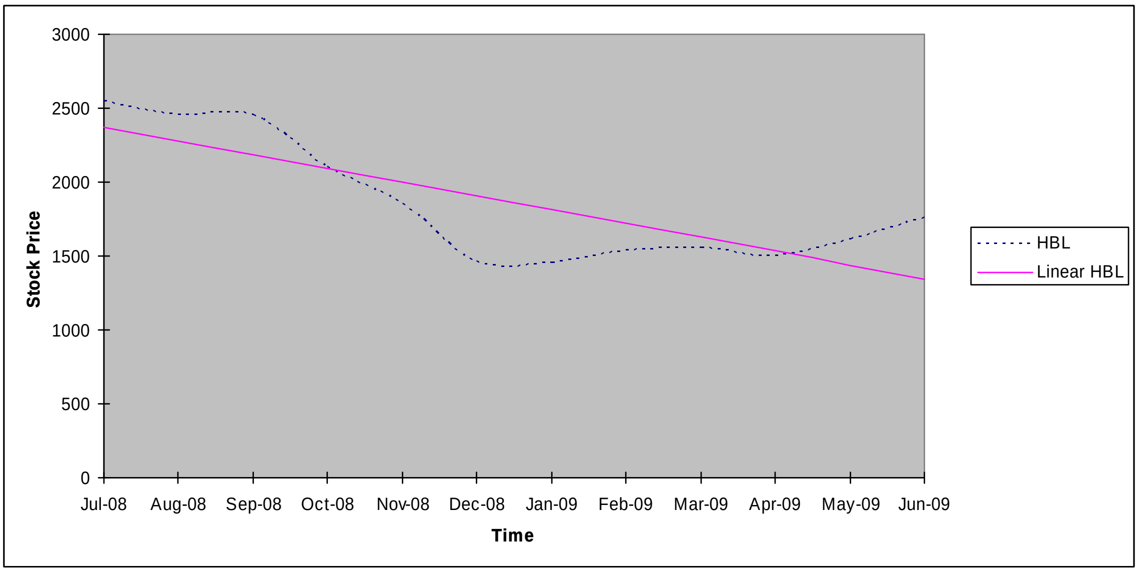


Source: Appendix-1

Fig 4.2 exhibits the stock price behavior of SCB. The maximum price of SCB is Rs 8526.00 in July 2008 and the minimum is Rs 4600.00 in February 2009 and the average price is Rs 5762.58.

Figure 4.3

Stock Price Behavior of HBL

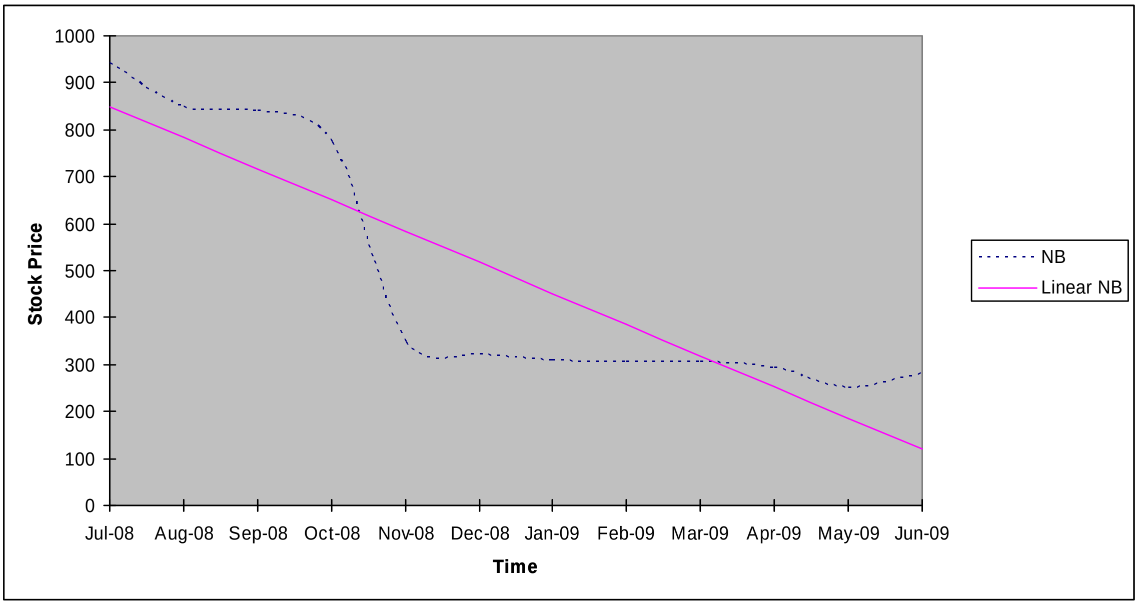


Source: Appendix-1

Figure 4.3 exhibits the stock price behavior of HBL. The maximum price of HBL is Rs 2546.00 in July 2008 and the minimum is Rs 1456.00 in January 2009 and the average price is Rs 1856.83.

Figure 4.4

Stock Price Behavior of NB

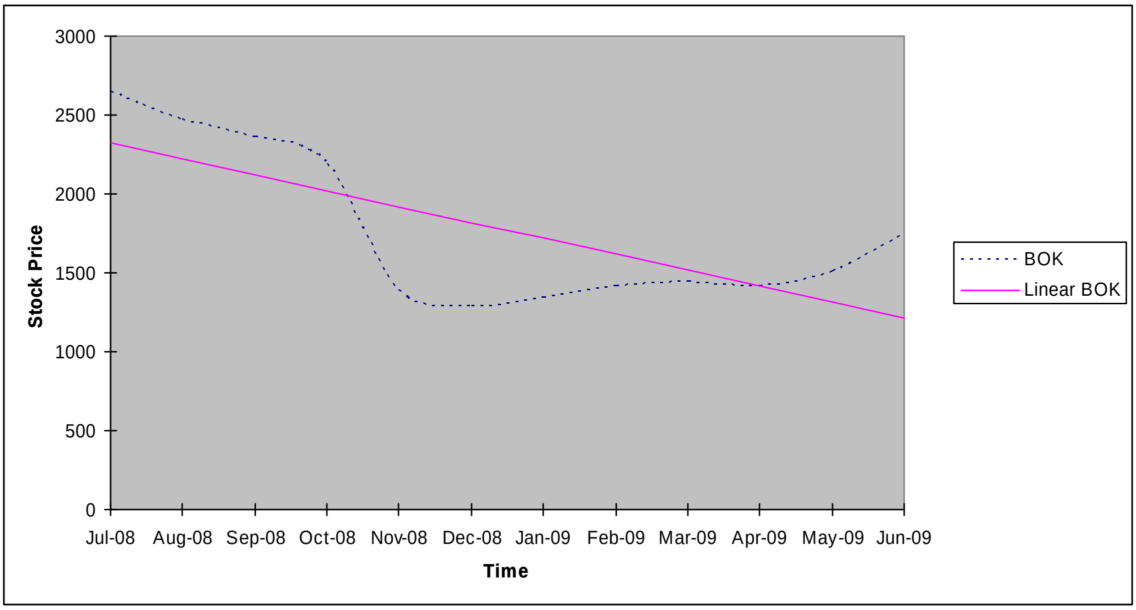


Source: Appendix-1

Figure 4.4 exhibits the price behavior of NB. The maximum price of NB is Rs 940.00 in July 2008 and the minimum is Rs 250.00 in March 2009 and the average price is Rs 484.92.

Figure 4.5

Stock Price Behavior of BOK



Source: Appendix-1

Figure 4.5 exhibits the stock price behavior of BOK. The maximum price of BOK is Rs 2649.00 in July 2008 and the minimum is Rs 1283.00 in December 2008 and the average price is Rs 1768.92.

4.1.2 Volatility of Daily Stock Prices

Only the graphical presentation is not sufficient. To gain the actual knowledge, some statistical tools are used to analyze the daily stock price behavior. Therefore, this part presents the computation of average prices (mean), standard deviation (SD) and coefficient of variation (CV). Based on the analysis of absolute variation (SD) and relative Variation (CV), volatility of daily stock price is determined. The computation of stock volatility is shown in table 4.1.

Table 4.1

Computation of Stock Volatility

Banks	Mean	Std. Deviation	C.V
NABIL	4035.17	739.39	0.1832
SCB	5762.58	1448	0.2513
HBL	1856.83	420.1	0.2262
NB	484.92	273.68	0.5644
BOK	1768.92	503.12	0.2844

Source: appendix-4

The mean shows the average value for each stock price of the sampled banks. The highest average value is of SCB where as the lowest average value is of NB. The standard deviation indicates the amount of variability in stock. Among the computed standard deviation of the sampled banks, the standard deviation of SCB is 1448, which indicates that the most volatile stock is of SCB. Similarly, the computed SD of NB is 273.68, which conveys that its stock is less volatile. The stocks of Nabil, BOK, HBL are consecutively volatile.

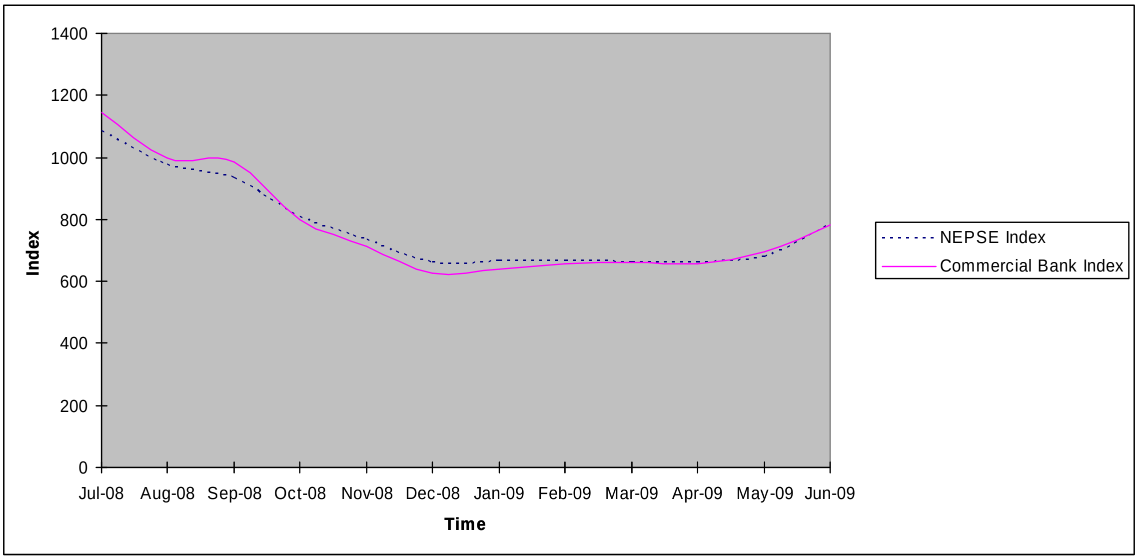
Only measuring the absolute variation is not sufficient to conclude the variation in the stock, if the alternatives need relative measure. The computed values of CV indicate the variance in the stock. CV, which is equal to 1, is considered as an exponential distribution whereas; CV with the distribution less than 1 is considered low variance. In the above computation all those stocks can be considered as low variance.

4.1.3 Analysis of Co-Movement of Commercial Bank Index and Nepse Index

This part presents the graph exhibiting the co-movement between commercial bank index and NEPSE index. Based on the index series, variation is compared between them. For this observation, monthly closing index points are extracted from the annual NEPSE trading report 2008/09. Fig 4.6 clearly exhibits the graph of daily co-movement between commercial bank index and NEPSE index.

Figure 4.6

Co- movement between Indices of NEPSE and Commercial Bank



Source: Appendix-2

In the figure 4.6 index points describes the commercial index and NEPSE index. The index series of the commercial bank clearly exhibits that the fluctuation is higher than the NEPSE index. The maximum point of the commercial bank is 1143.63 on July 2008 where as the minimum point is Rs 627.39 on December 2008. In case of index series of Nepse the maximum point is Rs 1084.76 on July 2008 and the minimum point is Rs 659.81 on December 2008.

4.2 Descriptive Analysis

The explanation below provides the summary of descriptive statistics with respect o both dependent and explanatory variables. This shows the average indicators of variables computed from the financial statements. The regression equation is calculated using SPSS 15.0 software program as shown in appendix-5.

4.2.1 Simple Regression Equation

The next aspect of the study is devoted to analyzing how NEPSE is related to Amount to public issue, Paid up value and Total turnover. For the purpose, the average slopes were computed from linear regressions of return on NEPSE on various measures such as Amount to public issue (PI), Paid up value (PV) and Annual turnover (AT). NEPSE has been specified as the dependent variable and the independent variables are specified as PI, PV and AT. The results are presented in table 4.2.

The results are based on time series data of 5 banks with 1026 observations for the period of 2003/05 to 2008/9 by using simple regression equation. The model is, NEPSE= a + B_1 (independent variable) + E. Results for various subsets of independent variables are presented as well.

Table 4.2

Estimated Relationship between NEPSE and Fundamental Variables

Independent Variable	**Constant (a)**	**Regression Coefficient**	**R^2**	**SEE**	**F**
Amt(PI)	60.598 (.386)	.186 (2.071)*	.589	145.37671	4.291
Paid up(PV)	-386.550 (-1.813)	.044 (3.565)	.809	99.03124	12.712
Turnover(AT)	120.515 (1.831)	.062 (4.364)	.864	83.60258	19.047

Notes: Figures in parentheses are t- values

*The sign * denotes that the results are significant at 5 percent level of Significance*

With respect to the computed regression equations shows that all the beta coefficients have priori expected signs. Above table shows the simple regression analysis between NEPSE and other independent variables. Here, only a few beta coefficients are found to be significant. Among others, the above results indicate that Paid up value (PV) of all securities are negatively related to NEPSE while Amount of public issue (PI) and Annual Turnover (AT) are all positively related. As NEPSE decreases, an increase can be noticed on Paid up value while a decline can be noticed in Amount on Public issue and Annual Turnover. The result of t-statistic indicate that the variable PI and AT have higher explanatory power. Similarly, adjusted R square (R^2) is 0.589, 0.809 and 0.864 respectively. This indicate 58.9%, 80.9% and 86.4% variation in dependent variable NEPSE is explained by independent variables PI, PV and AT respectively.

4.2.2 Multiple Regression Equation

After examining the simple regression analysis among the selected variables, the multiple regression analysis has been undertaken for the purpose of investigating the causality between dependent and independent variables. The multiple regressions open up several additional options to enrich analysis and make modeling more realistic compared to the simple regression.

For the purpose, the average slopes were computed from linear regressions of NEPSE on various measures such as Amount to public issue (PI), Paid up value (PV) and Annual turnover (TT). NEPSE has been specified as the dependent variable and the independent variables are specified as (PI), (PV) and (AT).

This model is developed to unravel the separate influence of the various variables on NEPSE and the results are presented in table 4.3. The model is:

$$NEPSE = a + b_1PI + b_2PV + b_3AT + E$$

With respect to the computed multiple regression equations shows that all the beta coefficients have priori expected signs. However, only a few beta coefficients are found to be significant. The positive regression coefficient indicates that there is an increase in the PV and AT. The regression constant in multiple regression NEPSE on PI, PV and AI is -755.984. The results of t-statistics indicate that none of the selected variable is significant. However adjusted R square is 0.962. this indicate about 96.2% variation is dependent variable NEPSE is explained by independent variable Amount on public issue (PI), Paid up value(PV) and Annual Turnover (AT). The values of R squared range from 0 to 1. Here, R square being 0.962 indicates that the independent variables do explain the dependent variable NEPSE. The result of multiple regression analysis presented that, the relationship between NEPSE (the dependent variable) is negative with Amount in public issue where as it has positive relation with Paid up Value and Annual turnover.

The results are based data related to the securities market as a whole for the period of 2004/05 to 2008/09 by using multiple regression model stated above. Results for various subsets of independent variables are presented as well.

Table 4.3

Estimated Relationships between NEPSE and Fundamental Variables

Model	Constant (a)	Regression Coefficients of			R^2	SEE	F
		AMT	Paid Up	Turn Over			
1	-775.984 (-1.358)	-.291 (-1.295)	.091 (1.535)	.015 (.450)	.962	76.365	8.475

Notes: Figures in parentheses are t- values

*The sign * denotes that the results are significant at 5 percent level of Significance*

4.3 Test of Random Walk Hypothesis

As stated in methodology, independency of successive price is tested using the serial correlation and run tests. In this section, first, results of serial correlation are analyzed and then of run tests.

4.3.1 Analysis of the Results of Serial Correlation (Autocorrelation)

Autocorrelation/serial correlation technique measures the correlation coefficient among the series of stock prices with the lagged numbers in the same time data series. Autocorrelation coefficients for each day in the sample were computed to test the hypothesis that successive share price changes are independent. It is computed under 1 natural log differences for lags 1 to 10. If the observed autocorrelation coefficient among price changes be zero, the hypothesis would be accepted. It means past price contains no predictive values regarding the future price changes i.e. no return above the normal return can be earned by exploiting a sequence of historical prices. In this situation the hypothesis will be rejected. It means that the market is inefficient in pricing shares. Moreover, larger the values of coefficient (both positive and negative) i.e. departed from zero, greater the dependence in the service of price changes.

The autocorrelation coefficients and standard errors of each stock of daily log price for 5 sample company shares have been computed for 1 to 10 lag days according to the equation (3.2) and (3.3) of methodology chapter and presented its summary in appendix-7 these coefficient helps to find out whether there is any degree of independence or dependence between successive price changes for last 10 days in predicting next day's price changes.

The results of autocorrelation coefficient for daily price series have been computed for lag 1 to 10. The first, second, sixth, ninth and tenth order coefficient shows the small serial dependence. It means if the order shifted in increasing order, the serial dependence also increases. According to appendix-7 two out of five in first, second sixth, ninth and tenth order coefficient are negative. Likewise, five out of five in third order coefficient are negative. While three of the fourth, fifth and seventh order and five out of five in eighth order coefficient have negative value.

The result of daily autocorrelation can also be explained by taking an average among five banks coefficient in different lag period from lag 1 to 10. In an average lag period 1, 2, 5 and 10 shows the positive correlation coefficient where as other shows the negative correlation coefficient. In lag period 1 the highest coefficient is 0.258 of Nabil and the lowest or negative coefficient is of (.132) of NB bank.

However, agreement in the sign among the coefficients for the different securities is not a necessary evidence for consistent pattern for dependence. King (1996) has shown that the price changes for different securities are related (although not all to the same extent) to the behavior of the market component common to all securities. The autocorrelation coefficient of a given security for any given sampling period will be partly determined by the serial behavior of the market component and partly by the serial behavior of factors pertaining to that security and perhaps also to its industry (Fama, 1965:73-75). Since market components are common to all securities its behavior during the sampling period may tend to produce a common sign for the autocorrelation coefficient of all the different securities. Therefore it is desirable to measure the degree of dependence. Both the judgment of coefficient magnitude and statistical significance test of autocorrelation coefficient are required to be performed. Summary results of differences taken from appendix-7 are given in table 4.4 which shows the statistically significant and non-significant series for lag 1 to 10.

Table 4.4

Series having significant values of first order to Tenth order Autocorrelation coefficient

Lag days	Series having coefficient<2std error	Series having coefficient>2std error	Series having coefficient>3std error	Total Series
1	2,3,4,5	-	1	5
2	2,3,5	1	4	5
3	1,2,3,4,5	-	-	5
4	1,2,3,4,5	-	-	5
5	1,2,3,4,5	-	-	5
6	1,2,3,4,5	-	-	5
7	1,2,3,4,5	-	-	5
8	1,2,3,4,5	-	-	5
9	2,3,4,5	1	-	5
10	1,2,3,4,5	-	-	5
Total	46	2	2	50

Note: For names of the different price series, please see Appendix-7 and 8

The above table is derived from appendix-7 for the distribution of the statistically coefficient series. The first column indicates the various lag days. Out of the total series, coefficient having less than two times standard error is given in the second column which was considered as statistically non significant. Third column consists of the coefficient having two or more than two times of its computed standard error. The fourth column consists of the coefficient having three or more than three times of its computed standard error. In the end, the last column shows the total number of series covered by the study.

The result based on the table 4.4 and the appendix -7 presents a different picture. Only 4 out of 50 coefficients are dispersed from the expected value zero. It means these 4 coefficients were statistically significant. It indicates that the day to day fluctuations are serially dependent in most of the cases. Out of these 4 coefficients 2 coefficients had the value three or more than three times greater than its computed standard error. Likewise, remaining 2 coefficients had the values twice but not three times greater than its computed standard error. Other 46 correlation coefficients had values less than two times greater than its computed standard error which was considered as not statistically significant. Those 4 deviated coefficient and other negative values give hint that high degree of autocorrelation exists. These coefficients are also significantly deviated from zero and not statistically significant. It implies that the successive price changes are dependent. Thus, H0 stated in Methodology has been rejected and HA been accepted. This result corroborates with the findings of the previous studies (Pradhan and Upadhyay, 2004 and Paudel, 2005). Therefore, it can be said that price changes are not independent and historical price of the stock provide important information in predicting tomorrows price change.

For these price series, the mean absolute autocorrelation coefficient for lag 1 was 0.0156, which was the highest average coefficient among the 10 different lags. Likewise the least absolute average mean was 0.0114, which was associated with lag 10. Out of 10 lags, 6 mean absolute had negative value and remaining 4 had positive value. The largest of these autocorrelation coefficients was 0.258 for Nabil Bank. The smallest was 0.009 for BOK also for lag 1. Out of the 5 serial correlation coefficient four of the first order are less than two times the standard error and for another one bank is greater than three times the standard error values. It may also be noted that in the second order coefficient among the 5, three are less than two times the standard error and one of them is greater than two times the error where as one is greater than three times the standard error. In ninth period also four coefficients are greater than two times the error and one is less than two times the error. However, for longer lags the coefficients are relatively small and statistically insignificant and more negative values, thereby implying some little linear independence among the daily changes.

The result of autocorrelation showed that the observed first order coefficients are found to be relatively larger and statistically significant for most of the stocks, except Bank of Kathmandu. It also shows the pre dominance of negative sign. Third and eighth lags exhibit the predominance of negative sign where as lag 1, 2, 9 and10 shows the dominance of positive signs. Since the coefficient has more negative values it means that most of the observed coefficient are departed from zero. Thus we can say that few stocks had mild serial dependence. It can hardly used for predicting their future course in a meaningful manner. From the view of investors, such low order dependence may be enough to increase their expected profit to some extent. All above evidence related traded stocks indicate small auto dependence among day to day price changes. This evidence support that random walk hypothesis model may not be appropriate to describe the price behavior or provide some evidence of existence of arbitrage profits.

4.3.2 Analysis of the Results of Run Test

A run is defined as the sequence of price changes in the same sign. For the stock price behavior, there are three types of price change pattern namely positive, negative and zero which are known as three types of runs. This test is non parametric in nature and is used to examine independence assumption that the price changes are independent.

Testing the hypothesis of independence, the deviation between the total, actual and the total expected number of runs are analyzed. This hypothesis of independence can be tested by using the equation (3.4), (3.5), (3.6), and (3.7). There should not be significant difference between the actual and the expected number of runs to support the hypothesis of the study. The total number of actual and expected run value of standard error, value of normal variant Z and K are presented in table 4.5

Table 4.5

Computation of Run Test

S.No.	Banks	No of Observations	Actual Runs(R)	Expected Runs(M)	Standard Error($\pm_m$)	Standard Variable(Z)	R-M/M (K)
1	NBL	205	99	128.87	6.41	-4.58 **	-0.23
2	SCB	199	111	131.81	9.54	-2.13*	-0.16
3	HBL	190	100	121.56	9.72	-2.17*	-0.18
4	NB	212	113	127.59	10.92	-1.29	-0.11
5	BOK	220	126	136.55	10.80	-0.84	-0.08
	Total	1026	549	646.38	47.39	-11.01	-0.76
	Average	205.2	109.8	129.276	9.478	-2.202	-0.152

Source: Calculation of its recorded number based on official record of closing price of share transaction in NEPSE (Appendix-1)

As presented in the above table, the expected number of runs (M) was higher than the actual number of runs (R). The value of Z and K of all companies were also negative. The average values were -2.202 and -0.152 respectively. It indicates that the total actual number of runs fall short of total expected number of runs. However, the absolute amount of dependence in the price change is more important than whether the dependence is positive or negative. Therefore, it is desirable to test the values of standard normal variate Z for significance.

Table 4.6

Names of Companies Having Significant Value of Standard Normal Variate Z at 5% & 1% Level of Significance

S.NO	Name of bank	Level of significance	
		5%	1%
1	NBL	R	R
2	SCB	R	-
3	HBL	R	-
4	NB	R	-
5	BOK	-	-
Total		4	1

Note: R indicates that the hypothesis of independence is rejected

The above table is based on table 4.5. Inspecting the above table, which gives the information regarding the composition of standardized variable, it can be seen that the standard normal variate Z is significant (at 5% and 1%) in respect of five sampled banks. At 5% level of significance, hypothesis of NBL, SCB, HBL, and NB is rejected where as null hypothesis of BOK is accepted. Looking at 1% level of significance hypothesis of NBL is rejected whereas of other 4 banks are accepted. It is notable that this would imply a positive serial dependence among the price change (Dryden, 1970). The serial correlation analysis carried out in earlier section and if the values of autocorrelation is near to zero it is the indication of independence. But if the value departs significantly from zero, in positive and negative direction it causes dependence among the time series data accordingly either direction.

The value of standard normal variate Z is presented in second last column of table 4.5. The average value of Z is /2.02/. The value of percentage difference between actual and expected run are given in last column of Table 4.5. Most of the results are quite large due to the lower values of actual runs over expected runs values. All values of Z as well as K are in negative sign. The percentage difference varied from lowest 8% and highest 23%. However mean absolute value of K is /0.152/.

Table 4.7

Result of Percentage Difference between the Actual and Expected Number of Runs as Proportion of Expected Number of Runs

Percentage of inequalities and Equalities of K	Number of K
K having percent difference <= 10	1
K having percent difference <=18	3
K having percent difference > 20	1
Total	5

Source: Appendix -1

This table indicates that the percentage difference between actual and expected number of runs are quite higher. Out of five stocks, only one stock is less than or equal to 10%. Three out of five stocks are less than 18%. One stock out of five stocks is greater than 20%. In conclusion, there is significance difference between expected and actual number of runs in the daily price change series. These evidences suggest that the random or weak efficient market hypothesis does not support the daily closing stock of NEPSE. In general, the result shows that there is a significant difference between actual and expected number or runs in the series of price change. Based on these findings, these companies do not follow random walk model, but support the result based on autocorrelation analysis. This result is consistent with the previous result from the studies entitled “Share Price Behavior of listed Companies”, and “The Efficient Market Hypothesis and the Behavior of Share Prices in Nepal”, by Resham Lal Poudel and Radhe S. Pradhan and Basu D Upadhyay.

In conclusion, the both tests, either the autocorrelation or the run test normally do not support the independence assumption of random walk model or weak efficient market hypothesis. It suggests that Nepalese stock market may not be defined as “efficient in weak sense” in pricing the stock where market efficiency is defined as absence of arbitrage opportunities, their having been eliminated by arbitragers (Van Horne,2002).

CHAPTER - V

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Summary

The study is conducted to reveal the current status of stock price behavior in Nepal Stock Exchange. This study mainly aims at examining the stock price behavior of commercial banks in Nepal and to test whether successive price changes are dependent or not and thereby identifying arbitrage profits. Its specific objectives are (i) To analyze the the existence of arbitrage profits in the stock prices of the commercial banks operating in the present context of Nepal. (ii) To analyze the behavior of those commercial banks index and NEPSE index. (iii) To determine whether the present Nepalese stock market is efficient in pricing shares. (iv) To outline the possible implications and also to recommend for the betterment of stock market.

The study has been done with both primary and secondary data. The required secondary data are collected mainly from the annual report of listed companies and the web page of NEPSE *www.nepalstock.com*. Other sources of secondary data are the various publications of Securities Board of Nepal and Nepal Stock Exchange Ltd. Review of national and international journals, books as well as masters degree dissertation are discussed in order to make the studies more effective. The study period is from July 16 2008 to July 16 2009 consisting of 1026 observations.

Both the analytical and descriptive research designs are adopted to carry out this study. The stock market performance is examined by analyzing the number of listed companies in NEPSE. Statistical tools as well as the model are used to analyze the behavior of share price of the sampled banks. Run test is used to know whether the movement of market price of stock is random or not.

Autocorrelation test is done to find the dependence of the price changes. In short, it analyzes whether the price changes are linearly correlated or not. To this end, the independent assumption examines the successive prices in natural logarithm of shares of five commercial banks listed in NEPSE. The regression, autocorrelation and the run test were adopted as test methodology.

To test the independent assumption, the serial (auto) correlation coefficients were estimated among the first difference of log prices for different lags. The estimated autocorrelation were found significantly deviated from the expected value zero. It means that the log price series of shares were serially dependent. Therefore, the random walk model was not accepted for most of the cases. The run test was also conducted to test the hypothesis of randomness. For this purpose, percentage difference between actual and expected number of runs were examined. The result of run test also supported the result of autocorrelation test. In most of the cases, significant difference between actual and expected number of runs were observed. So, the series was found to be non-random and the evidence did not support the assumption of independence.

The result of serial correlation test and run test did not support the hypothesis of independence. The result, however, demonstrated that the successive price changes are dependent with historical price series. Thus, the hypothesis of randomness was also rejected. It is important to note here that in come cases two tests have different conclusions. Such differences may arise from two ways. Firstly, the autocorrelation tests only claim to investigate whether or not the price changes are linearly correlated. Secondly, the run tests help to find out whether the price changes follow some trend, not necessary linear.

5.2 Major Findings of the Study

The major findings in this chapter are explained below:

1. The graph of all the sampled commercial banks shows the upward slope of the trend line and this exhibits the increasing trend in the price of the stock.

2. The computed value of SD and CV indicates the variability and volatility of the stock. The CV of the above share price indicates that all the stocks are low variance as the computed CV is less than 1. The mean shows the average value for each stock price of the sampled banks. The highest average value is of SCB where as the lowest average value is of NB. The standard deviation indicates the amount of variability in stock. Among the computed standard deviation of the sampled banks, the standard deviation of Nabil is 617.87, which indicates that the most volatile stock is of Nabil. Similarly, the computed SD of NB is 78.08, which conveys that its stock is less volatile. The stocks of SCB, HBL, BOK consecutively volatile.

3. The daily co-movement of the series of indices has exhibited the fluctuation of commercial bank index and NEPSE index. The CV of both the indices NEPSE and commercial bank have same CV that is 14%. This indicates that both the indices have same volatility.

4. Simple regression as well as multiple regressions is shown between NEPSE, amount on public issue, paid up value and annual turnover. The regression coefficients are 0.186, 0.044 and 0.062 respectively and they all are positive. Which indicate that one rupee

increase/decrease in the independent variable affects the dependent variable Nepse.

5. The first order autocorrelation coefficient, for most of the equity shares is statistically significant from expected value zero. The evidence pertaining to most of the shares indicates serial dependence. Thus, this evidence suggests that the Nepalese market does not accept random walk hypothesis and some price changes can even predict some valuable information in predicting future price change. Therefore, opportunities for arbitrage profits exist for sophisticated investors in Nepalese stock market.

6. The total numbers of actual and expected runs are statistically significant for most of the shares, which implies that price changes are significantly different from random series. Results of run test also support the result of autocorrelation. Therefore, today's price change is dependent on the information of yesterday's price which means the presence of arbitrage profits.

7. The mean absolute values of the autocorrelation are lower when lag days are increased. This means the information of past price changes have little role to predict changes for longer days.

8. The result of t-statistic under simple regression indicates that the variable PI and AT have higher explanatory power. Similarly, adjusted R square (R^2) is 0.589, 0.809 and 0.864 respectively. This indicate 58.9%, 80.9% and 86.4% variation in dependent variable NEPSE is explained by independent variables PI, PV and AT respectively. Whereas, the results of t-statistics on multiple

regression indicate that none of the selected variable is significant. However adjusted R square is 0.962. this indicate about 96.2% variation is dependent variable NEPSE is explained by independent variable Amount on public issue (PI), Paid up (PV) and Annual Turnover (AT) respectively.

9. There include low order serial dependence, which helps in certain extent to increase investors expected profit.

10. Because the persistence hypothesis has been supported by the result of autocorrelation and the run test, professional investors either individual or institutional can beat the market. Therefore, to make greater profit than ‘naïve buy and hold strategy’, acute fundamental or other analysis are required which accurately predicts the appearance of the new information in the market that affects the price of shares.

To conclude, results of both test analysis generally suggests that the random walk model can not justifiably used to describe share price behavior in Nepal. Nepalese stock market may not be defined as the weakly efficient in pricing shares. This would mean that above average return may be earned simply from past price knowledge. This study suggests that the fundamental (intrinsic value) analysis becomes useful to make above average return in Nepalese stock market. The charts of past price movements may also have some values as an investment strategy in trading of shares in such market situations.

5.3 Conclusions

Observations of daily stock prices of sampled banks indicate that there is a large variation in their stock prices. They are not doing well in Nepalese stock market. Most of the serial coefficients are significantly deviated from zero and statistically insignificant. Both the analysis did not support the independent assumption of random walk model. It signifies that the successive price changes are dependent. The dependence in the series of the price changes implies that the price changes in the future will be dependent with the historical prices. Thus, the historical price is helpful to predict the future prices of shares. Therefore sufficient opportunities are available to individuals and institutional investors to make the higher expected profit. Runs test results also shows that the percentage of deviation between the observed and actual number of runs in the series of price changes is significant. It is obvious that the successive price changes are not random. Thus, RWH does not hold true in the context of Nepalese stock market providing the opportunity for arbitrage profits.

5.4 Recommendations

Findings of the study provide important information for those who are directly or indirectly concerned with the stock market activities. Thus, major recommendations are as follows:

1. Observation of volatility indicates that most of the sampled stocks exhibit large variation in their prices. They are not doing well. Therefore, the concerned authorities of sampled banks should monitor the causes of variation. Investors should be educated, self aware and informative regarding the daily stock price behavior. They should be extremely careful before making the investment decision.

2. The computed SD and CV have decided that the index of commercial sectors fluctuates more than NEPSE index. The perfect positive

correlation between them is observed. This implies the prosperity in the stock market. The series of commercial bank index indicates the dominance of its position in the co-movement graph. However, there should be clear pattern of index series. For this, the concerned authorities of the stock market should monitor the weaknesses of commercial sector as well as commercial sector.

3. Nepalese stock market is inefficient in pricing shares. Both the tests serial correlation and run test have rejected the RWH in this research. Conclusion of this study collaborates with the previous studies. Therefore it is suggested that the smart investors should take benefits of the short-term speculation. It is also recommended that the stock market makers should carry out the research work to find out the causes of inefficiency.

4. The randomness of the price movement in the Nepalese market, (shows that) professional traders, either individual or institutional, can earn arbitrage profits by beating the market. Thus, it is recommended that the investors should be aware of exploitation through short-term speculation where above average return is possible to some extent from past information.

5. Most of the price series of the shares indicates the serial dependence by the test of autocorrelation. This means the NEPSE market does not accept the Random walk hypothesis. It refers that the past price changes have great value for future price changes. So, it is recommended that the investors should study the past trend and pattern of price series of the stock for prediction of future price change to make safe investment.

6. The tests of both autocorrelation and run tests findings have shown that the successive price changes are dependent with the price of the historical change. So, it is recommended that the investors should consult with the fundamentalist and technical analyst before the investment in any shares of NEPSE market. They can give the fruitful suggestions.

7. This specific research studies only five commercial banks by covering the secondary data. Therefore, the forthcoming researchers should try to cover all the sectors listed in NEPSE. And it is better to study company wise.

APPENDIX - 1

Company Wise Monthly Transactions

Jul/Aug, 2008

Commercial Bank | **Sharwan 2065**

	Name of the company	Traded Share Quantity (in '000)	Traded Amount Rs. In million	Number Of Trades	High	Low	Closing	Average Price	Market Capitalizatio Rs. in million
1	Bank of Kathmandu	84.62	214.28	680	2870	2350	2649	2532	15977.21
2	Development Credit Bank Ltd.	83.10	72.52	507	992	825	905	873	2172.00
3	Everest Bank Ltd	14.82	47.01	278	3672	2750	3370	3171	12738.60
4	Himalayan Bank Ltd.	36.59	87.24	292	2730	1960	2546	2385	20643.22
5	Kumari Bank Ltd	71.89	74.56	456	1166	956	1087	1037	8152.50
6	Laxmi Bank Limited	41.54	49.56	289	1295	1072	1190	1193	8710.80
7	Lumbini Bank Ltd.	103.49	68.91	441	714	635	664	666	4980.00
8	Machhachapuchhre Bank Ltd	30.24	26.45	203	925	842	850	875	6984.04
9	Nabil Bank Ltd.	13.54	78.66	158	6400	5250	6101	5811	41937.85
10	Nepal Bangladesh Bank Ltd.	165.03	156.98	515	1020	882	940	951	6767.30
11	Nepal Credit & Com. Bank	1071.99	501.98	1232	577	437	529	468	3703.00
12	Nepal Investment Bank Ltd.	72.57	216.12	601	3670	2455	3281	2978	32896.42
13	Nepal Industrial & Co.Bank	69.39	103.58	493	1845	1300	1566	1493	12402.72
14	NMB Bank Ltd.	72.18	69.23	401	1018	915	990	959	1980.00
15	Nepal SBI Bank Limited	40.26	67.73	319	1897	1540	1710	1683	11077.43
16	Siddhartha Bank Limited	64.85	79.96	590	1380	1140	1300	1233	8970.00
17	Standard Chartered Bank Ltd.	15.42	117.47	183	8700	6627	8526	7618	52851.16
		2051.52	2032.27	7638					252944.25

Aug/Sept, 2008

Commercial Bank | **Bhadra 2065**

	Name of the company	Traded Share Quantity (in '000)	Traded Amount Rs. In million	Number Of Trades	High	Low	Closing	Average Price	Market Capitalizatio Rs. in million
1	Bank of Kathmandu	87.10	217.37	721	2720	2400	2475	2496	14927.75
2	Development Credit Bank Ltd.	52.36	45.40	319	903	820	856	867	2054.40
3	Everest Bank Ltd	13.89	43.75	198	3400	3080	3112	3149	11763.36
4	Himalayan Bank Ltd.	35.08	86.27	317	2560	2380	2450	2459	19864.85
5	Kumari Bank Ltd	52.95	54.35	376	1122	990	995	1026	7462.50
6	Laxmi Bank Limited	29.92	34.59	230	1240	1086	1213	1156	8879.16
7	Lumbini Bank Ltd.	96.59	65.69	551	739	628	681	680	5107.50
8	Machhachapuchhre Bank Ltd	29.55	24.71	253	877	790	800	836	6573.21
9	Nabil Bank Ltd.	19.26	110.83	238	6151	4000	4100	5755	28183.11
10	Nepal Bangladesh Bank Ltd.	494.35	424.30	433	959	846	849	858	6112.17
11	Nepal Credit & Com. Bank	309.77	146.83	782	550	440	470	474	3290.00
12	Nepal Investment Bank Ltd.	78.80	221.65	675	3411	2080	2280	2813	22860.06
13	Nepal Industrial & Co.Bank	65.37	102.44	520	1650	1458	1485	1567	11761.20
14	NMB Bank Ltd.	50.71	47.99	335	985	925	935	946	1870.00
15	Nepal SBI Bank Limited	24.11	40.09	212	1738	1570	1650	1663	10688.75
16	Siddhartha Bank Limited	50.36	64.26	466	1325	1220	1263	1276	8714.70
17	Standard Chartered Bank Ltd.	15.51	125.76	262	8590	7750	7858	8106	48710.34
		1505.68	1856.28	6888					218823.06

Sept/Oct, 2008

Commercial Bank **Aswin 2065**

	Name of the company	Traded Share Quantity (in '000)	Traded Amount Rs. In million	Number Of Trades	High	Low	Closing	Average Price	Market Capitalization Rs. in million
1	Bank of Kathmandu	57.46	141.35	456	2695	2305	2361	2460	14240.17
2	Development Credit Bank Ltd.	29.12	24.85	198	880	830	840	853	2016.00
3	Everest Bank Ltd	6.26	18.90	81	3120	2850	3033	3017	11464.74
4	Himalayan Bank Ltd.	6.29	15.57	79	2510	2440	2450	2476	19864.85
5	Kumari Bank Ltd	32.79	33.11	272	1080	965	1020	1010	7650.00
6	Laxmi Bank Limited	85.16	114.81	414	1468	1196	1350	1348	9882.00
7	Lumbini Bank Ltd.	23.39	15.32	147	684	634	673	655	5047.50
8	Machhachapuchhre Bank Ltd	50.69	43.17	327	918	770	880	852	7230.53
9	Nabil Bank Ltd.	8.77	35.33	97	4182	3900	3980	4029	27358.24
10	Nepal Bangladesh Bank Ltd.	451.42	379.74	217	890	830	840	841	6047.38
11	Nepal Credit & Com. Bank	168.68	76.59	270	480	432	452	454	3164.00
12	Nepal Investment Bank Ltd.	17.62	39.21	147	2300	2140	2200	2225	22057.95
13	Nepal Industrial & Co.Bank	33.93	50.83	242	1565	1410	1415	1498	11206.80
14	NMB Bank Ltd.	21.81	20.53	151	1010	900	918	941	1836.00
15	Nepal SBI Bank Limited	12.16	20.01	106	1795	1545	1559	1646	10099.25
16	Siddhartha Bank Limited	38.91	49.98	332	1326	1248	1281	1285	8838.90
17	Standard Chartered Bank Ltd.	11.00	89.69	144	9200	7750	7750	8155	48040.87
		1055.46	**1168.95**	**3680**					**216045.18**

Oct/Nov, 2008

Commercial Bank **Kartik 2065**

	Name of the company	Traded Share Quantity (in '000)	Traded Amount Rs. In million	Number Of Trades	High	Low	Closing	Average Price	Market Capitalization Rs. in million
1	Bank of Kathmandu	74.73	165.42	552	2360	2000	2190	2214	13208.79
2	Development Credit Bank Ltd.	78.89	66.97	564	915	725	783	849	1879.20
3	Everest Bank Ltd	1.75	5.01	37	3017	2352	2352	2864	8890.56
4	Himalayan Bank Ltd.	12.07	27.26	120	2401	2100	2100	2260	17027.01
5	Kumari Bank Ltd	62.02	59.29	432	1020	829	905	956	6787.50
6	Laxmi Bank Limited	58.32	77.39	288	1410	1175	1190	1327	8710.80
7	Lumbini Bank Ltd.	42.12	25.67	170	660	530	570	609	4275.00
8	Machhachapuchhre Bank Ltd	21.69	17.22	159	880	718	740	794	6080.22
9	Nabil Bank Ltd.	22.20	83.76	189	4000	3500	3775	3774	25949.09
10	Nepal Bangladesh Bank Ltd.	154.07	124.52	768	937	735	775	808	5579.43
11	Nepal Credit & Com. Bank	137.81	57.28	394	445	373	401	416	2807.00
12	Nepal Investment Bank Ltd.	65.03	110.28	588	2348	1280	1331	1696	13345.06
13	Nepal Industrial & Co.Bank	56.56	73.44	351	1405	1098	1263	1298	10002.96
14	NMB Bank Ltd.	32.72	28.48	238	940	769	800	870	1600.00
15	Nepal SBI Bank Limited	37.66	52.46	255	1581	1202	1355	1393	8777.73
16	Siddhartha Bank Limited	51.88	59.95	459	1285	980	1111	1156	7665.90
17	Standard Chartered Bank Ltd.	21.11	123.80	310	8036	4700	5090	5864	31552.00
		930.63	**1158.21**	**5874**					**174138.25**

Nov/Dec, 2008

Commercial Bank **Mangsir 2065**

	Name of the company	Traded Share Quantity (in '000)	Traded Amount Rs. In million	Number Of Trades	High	Low	Closing	Average Price	Market Capitalization Rs. in million
1	Bank of Kathmandu	98.46	192.42	795	2200	1365	1390	1954	8383.66
2	Development Credit Bank Ltd.	66.44	49.97	508	830	639	760	752	1824.00
3	Everest Bank Ltd	1.76	3.79	41	2350	2015	2095	2152	7919.10
4	Himalayan Bank Ltd.	15.61	30.65	162	2105	1830	1850	1963	14999.99
5	Kumari Bank Ltd	68.40	59.07	587	949	682	860	864	6450.00
6	Laxmi Bank Limited	8.13	8.46	88	1213	990	990	1040	7246.80
7	Lumbini Bank Ltd.	35.99	18.52	225	570	456	495	515	3712.50
8	Machhachapuchhre Bank Ltd	24.60	17.20	173	780	616	660	699	5422.90
9	Nabil Bank Ltd.	14.88	53.72	195	3911	3200	3701	3610	25440.41
10	Nepal Bangladesh Bank Ltd.	363.37	202.02	842	767	343	350	556	2519.74
11	Nepal Credit & Com. Bank	118.65	43.62	242	410	323	353	368	2471.00
12	Nepal Investment Bank Ltd.	70.29	89.14	600	1390	1137	1300	1268	13034.24
13	Nepal Industrial & Co.Bank	45.58	49.92	358	1270	890	905	1095	7167.60
14	NMB Bank Ltd.	43.31	33.38	268	875	698	805	771	1610.00
15	Nepal SBI Bank Limited	41.45	52.12	325	1456	1098	1206	1257	7812.51
16	Siddhartha Bank Limited	107.44	119.52	986	1218	848	1110	1112	7659.00
17	Standard Chartered Bank Ltd.	22.26	108.40	368	5145	4350	4875	4871	30219.26
		1146.62	**1131.93**	**6763**					**153892.71**

Dec/Jan, 2009

Commercial Bank **Poush 2065**

	Name of the company	Traded Share Quantity (in '000)	Traded Amount Rs. In million	Number Of Trades	High	Low	Closing	Average Price	Market Capitalization Rs. in million
1	Bank of Kathmandu	45.51	58.49	364	1380	1200	1283	1285	7738.30
2	Development Credit Bank Ltd.	21.06	14.49	206	760	620	620	688	1488.00
3	Everest Bank Ltd	4.93	9.45	77	2070	1855	2026	1916	7658.28
4	Himalayan Bank Ltd.	2.83	5.00	38	1865	1465	1465	1770	11878.37
5	Kumari Bank Ltd	37.91	29.91	307	861	711	711	789	5332.50
6	Laxmi Bank Limited	14.39	13.59	62	1028	841	992	944	7261.44
7	Lumbini Bank Ltd.	23.06	10.78	166	495	415	415	467	3112.50
8	Machhachapuchhre Bank Ltd	19.78	11.74	172	674	490	515	594	4231.50
9	Nabil Bank Ltd.	8.49	29.28	103	3700	3300	3350	3451	23027.67
10	Nepal Bangladesh Bank Ltd.	278.30	91.54	293	353	313	320	329	2303.76
11	Nepal Credit & Com. Bank	205.55	64.71	174	367	300	320	315	2240.00
12	Nepal Investment Bank Ltd.	32.59	38.96	276	1300	1088	1160	1196	11630.56
13	Nepal Industrial & Co.Bank	37.12	30.06	241	892	750	760	810	6019.20
14	NMB Bank Ltd.	14.03	10.45	139	816	593	604	745	1208.00
15	Nepal SBI Bank Limited	5.32	5.81	37	1183	1050	1050	1093	6801.93
16	Siddhartha Bank Limited	51.11	51.71	458	1120	810	820	1012	5658.00
17	Standard Chartered Bank Ltd.	11.42	53.58	164	4972	4550	4733	4691	29339.02
		813.40	**529.55**	**3277**					**136929.03**

Jan/Feb, 2009

	Commercial Bank		Magh 2065						
	Name of the company	Traded Share Quantity (in '000)	Traded Amount Rs. In million	Number Of Trades	High	Low	Closing	Average Price	Market Capitalization Rs. in million
1	Bank of Kathmandu	55.34	71.22	471	1380	1150	1340	1287	8082.09
2	Development Credit Bank Ltd.	16.46	9.72	152	640	550	601	590	1442.40
3	Everest Bank Ltd	6.63	12.85	130	2087	1856	2015	1938	7616.70
4	Himalayan Bank Ltd.	8.94	12.03	100	1500	1119	1456	1345	11805.39
5	Kumari Bank Ltd	50.20	33.92	404	737	590	728	676	5460.00
6	Laxmi Bank Limited	6.95	6.91	112	1092	874	1035	994	7576.20
7	Lumbini Bank Ltd.	65.66	30.90	339	607	365	425	471	3187.50
8	Machhachapuchhre Bank Ltd	26.88	12.38	210	515	400	464	460	3812.46
9	Nabil Bank Ltd.	14.83	49.02	196	3560	3050	3560	3306	24471.19
10	Nepal Bangladesh Bank Ltd.	117.24	35.39	334	329	290	308	302	2217.37
11	Nepal Credit & Com. Bank	122.70	37.46	301	348	262	334	305	2338.00
12	Nepal Investment Bank Ltd.	33.03	36.83	300	1223	990	1200	1115	12031.61
13	Nepal Industrial & Co.Bank	23.88	19.04	191	880	699	850	797	6732.00
14	NMB Bank Ltd.	16.53	9.95	142	656	550	610	602	1220.00
15	Nepal SBI Bank Limited	12.75	15.71	114	1420	1071	1320	1232	8551.00
16	Siddhartha Bank Limited	30.39	25.05	264	905	705	845	824	5830.50
17	Standard Chartered Bank Ltd.	20.27	88.69	318	4640	4100	4610	4376	28576.57
		628.68	507.05	4078					140950.98

Feb/Mar, 2009

	Commercial Bank		Falgun 2065						
	Name of the company	Traded Share Quantity (in '000)	Traded Amount Rs. In million	Number Of Trades	High	Low	Closing	Average Price	Market Capitalization Rs. in million
1	Bank of Kathmandu	55.14	80.68	445	1570	1340	1415	1463	8534.45
2	Development Credit Bank Ltd.	17.78	11.44	98	685	601	620	644	1488.00
3	Everest Bank Ltd	5.13	10.42	101	2121	1945	2040	2029	7711.20
4	Himalayan Bank Ltd.	8.62	13.46	77	1610	1456	1535	1561	12445.93
5	Kumari Bank Ltd	39.14	28.39	293	785	690	700	725	5250.00
6	Laxmi Bank Limited	39.03	35.66	192	1050	860	980	914	7173.60
7	Lumbini Bank Ltd.	22.01	10.03	132	507	413	429	456	3217.50
8	Machhachapuchhre Bank Ltd	31.01	16.13	181	609	455	495	520	4067.17
9	Nabil Bank Ltd.	27.03	95.30	169	3735	3420	3520	3526	24196.23
10	Nepal Bangladesh Bank Ltd.	46.02	14.28	196	326	298	307	310	2210.17
11	Nepal Credit & Com. Bank	76.03	25.92	202	377	315	325	341	2275.00
12	Nepal Investment Bank Ltd.	29.20	36.14	250	1346	1181	1190	1237	11931.35
13	Nepal Industrial & Co.Bank	28.76	26.22	244	1021	831	890	912	7048.80
14	NMB Bank Ltd.	11.04	7.05	75	673	598	637	639	1274.00
15	Nepal SBI Bank Limited	20.42	28.42	193	1520	1271	1400	1392	9069.24
16	Siddhartha Bank Limited	27.84	25.36	231	979	830	900	911	6210.00
17	Standard Chartered Bank Ltd.	16.85	77.69	250	4900	4500	4600	4612	28514.58
		501.05	542.59	3329					142617.22

Mar/Apr, 2009

	Commercial Bank		Chaitra 2065						
	Name of the company	**Traded Share Quantity** (in '000)	**Traded Amount** Rs. In million	**Number Of** Trades	**High**	**Low**	**Closing**	**Average Price**	**Market Capitalization** Rs. in million
1	Bank of Kathmandu	78.14	112.87	624	1530	1400	1445	1444	8715.39
2	DCBL Bank Ltd.	11.03	6.86	116	660	590	620	622	1488.00
3	Everest Bank Ltd	5.19	10.58	103	2230	1960	2230	2040	8429.40
4	Global Bank Limited	24.17	14.64	412	685	516	595	606	5950.00
5	Himalayan Bank Ltd.	5.83	9.08	82	1628	1501	1560	1558	12648.64
6	Kumari Bank Ltd	20.08	13.01	174	714	600	635	648	4762.50
7	Laxmi Bank Limited	9.10	7.73	156	995	800	929	850	6800.28
8	Lumbini Bank Ltd.	14.97	6.47	93	470	409	412	432	3090.00
9	Machhachapuchhre Bank Ltd	26.03	12.39	193	513	441	480	476	3943.93
10	Nabil Bank Ltd.	12.54	44.98	159	3700	3495	3560	3585	24471.19
11	Nepal Bangladesh Bank Ltd.	25.73	7.84	147	331	285	306	305	2202.97
12	Nepal Credit & Com. Bank	40.57	13.27	149	363	310	320	327	2240.00
13	Nepal Investment Bank Ltd.	27.05	32.12	183	1260	1147	1170	1187	11730.82
14	Nepal Industrial & Co.Bank	45.57	41.17	318	957	865	899	903	7120.08
15	NMB Bank Ltd.	16.62	10.07	106	630	588	610	606	1220.00
16	Nepal SBI Bank Limited	32.37	46.03	209	1535	1370	1440	1422	9328.37
17	Siddhartha Bank Limited	16.39	15.00	159	949	880	929	915	6410.10
18	Standard Chartered Bank Ltd.	20.38	94.70	255	4870	4500	4699	4647	29128.26
		431.76	**498.81**	**3638**					**149679.93**

Apr/May, 2009

	Commercial Bank		Baishakh 2066						
	Name of the company	**Traded Share Quantity** (in '000)	**Traded Amount** Rs. In million	**Number Of** Trades	**High**	**Low**	**Closing**	**Average Price**	**Market Capitalization** Rs. in million
1	Bank of Kathmandu	39.23	55.28	327	1465	1330	1420	1409	8564.61
2	DCBL Bank Ltd.	23.04	13.58	76	630	570	572	589	1372.80
3	Everest Bank Ltd	7.68	16.03	94	2325	2025	2125	2086	8032.50
4	Global Bank Limited	138.64	80.25	2224	605	516	559	579	5590.00
5	Himalayan Bank Ltd.	9.63	14.63	84	1600	1475	1500	1519	12162.15
6	Kumari Bank Ltd	7.10	4.42	70	645	590	625	622	4687.50
7	Laxmi Bank Limited	13.43	11.91	163	980	846	949	887	6946.68
8	Lumbini Bank Ltd.	12.64	5.26	109	430	388	421	416	3157.50
9	Machhachapuchhre Bank Ltd	13.06	5.88	88	492	412	475	450	3902.84
10	Nabil Bank Ltd.	7.02	25.36	119	3680	3550	3660	3611	25158.58
11	Nepal Bangladesh Bank Ltd.	136.71	39.15	126	311	272	294	286	2116.58
12	Nepal Credit & Com. Bank	36.14	11.13	128	326	300	310	308	2170.00
13	Nepal Investment Bank Ltd.	11.53	13.53	99	1240	1108	1172	1174	11750.87
14	Nepal Industrial & Co.Bank	19.92	17.77	193	930	850	902	892	7143.84
15	NMB Bank Ltd.	9.40	5.52	74	638	452	460	587	920.00
16	Nepal SBI Bank Limited	33.19	50.81	254	1670	1441	1545	1531	10008.56
17	Siddhartha Bank Limited	13.11	11.60	125	920	835	892	885	6154.80
18	Standard Chartered Bank Ltd.	24.68	115.65	206	4825	4599	4825	4685	29909.32
		556.15	**497.73**	**4559**					**149749.13**

May/Jun, 2009

	Commercial Bank		Jestha 2066						

	Name of the company	Traded Share Quantity (in '000)	Traded Amount Rs. In million	Number Of Trades	High	Low	Closing	Average Price	Market Capitalization Rs. in million
1	Bank of Asia Nepal Limited	8.81	4.16	129	533	432	456	472	4560.00
2	Bank of Kathmandu	64.28	97.50	531	1657	1382	1509	1517	9101.40
3	Citizens Bank Internal Ltd	9.62	5.34	125	588	524	549	556	5490.00
4	DCBL Bank Ltd.	7.09	2.96	79	451	392	399	418	957.60
5	Everest Bank Ltd	8.13	18.35	93	2460	2160	2345	2258	8864.10
6	Global Bank Limited	69.82	40.54	1241	632	501	528	581	5280.00
7	Himalayan Bank Ltd.	11.50	19.01	106	1860	1520	1610	1653	13054.04
8	Kumari Bank Ltd	15.70	10.14	128	735	600	612	646	4590.00
9	KIST Bank Limited	66.14	26.25	322	424	369	374	397	748.00
10	Laxmi Bank Limited	18.44	15.62	226	999	772	969	847	7093.08
11	Lumbini Bank Ltd.	28.00	11.89	188	475	387	404	425	3030.00
12	Machhachapuchhre Bank Ltd	16.15	7.33	124	512	408	412	454	3385.20
13	Nabil Bank Ltd.	15.13	62.34	241	4620	3640	4216	4120	28980.49
14	Nepal Bangladesh Bank Ltd.	77.22	21.60	365	316	227	250	280	1799.82
15	Nepal Credit & Com. Bank	304.31	89.26	306	334	271	295	293	2065.00
16	Nepal Investment Bank Ltd.	29.72	37.49	220	1420	1170	1190	1261	11931.35
17	Nepal Industrial & Co.Bank	46.30	45.65	394	1077	895	950	986	7524.00
18	NMB Bank Ltd.	9.49	4.53	80	515	439	439	477	878.00
19	Nepal SBI Bank Limited	44.07	75.15	364	1848	1545	1715	1705	11109.82
20	Siddhartha Bank Limited	35.34	33.70	274	1090	885	915	954	6313.50
21	Standard Chartered Bank Ltd.	32.61	174.39	328	5950	4658	5575	5347	34558.43
		917.87	803.19	5864					171313.83

Jun/Jul, 2009

	Commercial Bank	Ashadh 2066							
	Name of the company	Traded Share Quantity (in '000)	Traded Amount Rs. In million	Number Of Trades	High	Low	Closing	Average Price	Market Capitalization Rs. in million
1	Bank of Asia Nepal Limited	107.33	51.50	1698	575	432	571	480	5710.00
2	Bank of Kathmandu	63.75	100.31	570	1835	1473	1750	1573	10554.97
3	Citizens Bank Internal Ltd	74.86	42.23	1407	698	515	660	564	6600.00
4	DCBL Bank Ltd.	28.02	10.91	157	479	345	460	389	1104.00
5	Everest Bank Ltd	8.02	18.42	121	2480	2200	2455	2297	9279.90
6	Global Bank Limited	47.75	25.40	903	590	492	570	532	5700.00
7	Himalayan Bank Ltd.	11.57	19.00	110	1887	1515	1760	1641	14270.26
8	Kumari Bank Ltd	40.83	25.39	217	730	580	700	622	5250.00
9	KIST Bank Limited	66.50	23.44	212	381	328	378	353	756.00
10	Laxmi Bank Limited	9.18	8.93	83	1062	873	1062	972	7773.84
11	Lumbini Bank Ltd.	28.29	11.06	160	439	358	435	391	3262.50
12	Machhachapuchhre Bank Ltd	28.25	11.85	185	510	389	489	419	4017.87
13	Nabil Bank Ltd.	14.58	64.35	185	4920	4132	4899	4413	33675.38
14	Nepal Bangladesh Bank Ltd.	792.77	196.38	354	293	216	280	248	2015.79
15	Nepal Credit & Com. Bank	449.68	130.20	321	353	285	335	290	2345.00
16	Nepal Investment Bank Ltd.	32.42	38.66	212	1406	1125	1388	1192	13916.56
17	Nepal Industrial & Co.Bank	39.21	39.33	307	1152	930	1126	1003	8917.92
18	NMB Bank Ltd.	18.79	7.94	102	499	395	499	422	998.00
19	Nepal SBI Bank Limited	27.92	49.27	215	1938	1696	1900	1765	12308.26
20	Siddhartha Bank Limited	29.65	27.32	198	1071	861	1000	921	6900.00
21	Standard Chartered Bank Ltd.	14.21	81.17	184	6050	5580	6010	5712	37254.92
		1933.58	983.02	7901					192611.17

Source: www.nepalstock.com

Appendix-2

Daily Indices of Commercial Banks and NEPSE

Date	Commercial bank	NEPSE Index
16-Jul-08	1011.09	982.12
17-Jul-08	1024.90	991.91
20-Jul-08	1016.16	985.24
21-Jul-08	999.44	973.30
22-Jul-08	986.39	962.78
23-Jul-08	1001.81	972.47
27-Jul-08	1012.61	980.81
28-Jul-08	1014.07	983.07
29-Jul-08	1038.18	1001.99
30-Jul-08	1065.14	1020.05
31-Jul-08	1081.05	1034.02
3-Aug-08	1095.64	1047.67
4-Aug-08	1131.15	1075.34
5-Aug-08	1168.28	1102.10
6-Aug-08	1204.79	1128.13
7-Aug-08	1166.98	1101.36
10-Aug-08	1132.95	1075.51
11-Aug-08	1151.82	1088.91
12-Aug-08	1145.88	1085.03
13-Aug-08	1139.59	1079.58
14-Aug-08	1143.62	1084.76
18-Aug-08	1127.14	1075.87
19-Aug-08	1101.18	1057.53
20-Aug-08	1111.07	1064.28
21-Aug-08	1107.65	1062.24
24-Aug-08	1098.52	1057.36
25-Aug-08	1099.88	1068.17
26-Aug-08	1086.88	1087.80
27-Aug-08	1026.05	1086.19
28-Aug-08	1040.91	1119.65
31-Aug-08	1079.38	1175.38
1-Sep-08	1074.72	1134.39
2-Sep-08	1080.42	1102.39
3-Sep-08	1065.81	1064.01
4-Sep-08	1065.13	1067.20
7-Sep-08	1067.26	1071.08
8-Sep-08	1060.91	1058.64
9-Sep-08	1064.72	1051.20
10-Sep-08	1053.27	1029.85
11-Sep-08	1050.34	1028.50
15-Sep-08	1003.31	996.09
16-Sep-08	999.13	976.01
17-Sep-08	991.93	985.16
18-Sep-08	1011.80	1004.28
21-Sep-08	1010.81	976.81

22-Sep-08	1009.07	952.64
23-Sep-08	997.99	951.28
24-Sep-08	994.68	945.07
25-Sep-08	988.94	941.12
28-Sep-08	1002.44	954.60
29-Sep-08	1019.15	962.55
1-Oct-08	1031.82	970.23
5-Oct-08	1024.33	973.65
12-Oct-08	1017.61	969.56
13-Oct-08	1008.94	957.33
15-Oct-08	992.37	938.31
16-Oct-08	986.45	933.97
19-Oct-08	965.29	918.62
20-Oct-08	940.96	899.99
21-Oct-08	954.06	907.73
22-Oct-08	959.62	914.00
23-Oct-08	966.40	919.33
26-Oct-08	965.86	918.15
27-Oct-08	899.06	881.86
2-Nov-08	845.05	853.16
3-Nov-08	843.18	849.44
5-Nov-08	840.22	848.18
6-Nov-08	826.56	832.59
9-Nov-08	800.18	810.81
10-Nov-08	765.24	779.78
11-Nov-08	792.56	802.11
12-Nov-08	808.66	815.63
13-Nov-08	800.35	806.90
16-Nov-08	784.19	793.86
17-Nov-08	770.30	774.18
18-Nov-08	771.77	775.99
19-Nov-08	769.75	776.58
20-Nov-08	764.94	770.37
23-Nov-08	738.17	750.51
24-Nov-08	709.44	726.47
25-Nov-08	686.91	698.81
26-Nov-08	718.40	728.57
27-Nov-08	725.10	732.18
30-Nov-08	745.06	750.71
1-Dec-08	760.42	765.76
2-Dec-08	754.86	761.67
3-Dec-08	749.07	758.08
4-Dec-08	741.85	754.91
7-Dec-08	734.90	754.29
8-Dec-08	726.13	747.72
10-Dec-08	725.07	742.36
11-Dec-08	725.20	743.25
14-Dec-08	725.47	742.04
15-Dec-08	713.19	734.85

16-Dec-08	706.17	729.24
17-Dec-08	700.73	728.88
18-Dec-08	694.17	720.52
21-Dec-08	674.57	708.12
22-Dec-08	662.67	701.64
23-Dec-08	653.86	701.85
24-Dec-08	665.07	705.21
28-Dec-08	658.86	699.20
29-Dec-08	661.63	700.57
31-Dec-08	657.10	695.50
1-Jan-09	657.93	693.81
4-Jan-09	657.30	696.21
5-Jan-09	653.64	690.97
6-Jan-09	651.56	687.63
7-Jan-09	650.23	682.29
8-Jan-09	646.94	674.32
11-Jan-09	628.24	664.02
12-Jan-09	624.99	660.40
13-Jan-09	627.39	659.81
15-Jan-09	611.17	651.22
18-Jan-09	611.55	650.73
19-Jan-09	610.15	647.29
20-Jan-09	600.50	641.05
21-Jan-09	580.89	625.79
22-Jan-09	561.03	609.46
25-Jan-09	568.70	616.15
26-Jan-09	594.84	645.32
28-Jan-09	617.46	658.83
1-Feb-09	602.41	638.51
2-Feb-09	605.76	636.31
3-Feb-09	600.57	636.70
4-Feb-09	605.18	641.64
5-Feb-09	619.49	656.06
8-Feb-09	641.76	671.71
9-Feb-09	641.84	668.82
10-Feb-09	636.33	665.15
11-Feb-09	637.98	663.52
12-Feb-09	649.62	671.49
15-Feb-09	649.86	669.75
16-Feb-09	656.15	673.51
17-Feb-09	677.03	690.25
19-Feb-09	692.16	699.60
22-Feb-09	696.47	704.10
24-Feb-09	683.77	695.92
26-Feb-09	668.61	677.52
1-Mar-09	661.34	676.30
2-Mar-09	656.74	673.70
3-Mar-09	660.87	675.77
4-Mar-09	662.94	672.99

5-Mar-09	662.75	670.68
8-Mar-09	665.43	671.35
9-Mar-09	664.81	671.44
11-Mar-09	661.02	670.23
12-Mar-09	656.85	667.20
15-Mar-09	656.47	669.23
16-Mar-09	657.69	670.86
17-Mar-09	656.57	667.66
18-Mar-09	657.23	667.13
19-Mar-09	656.36	666.59
22-Mar-09	674.29	683.50
23-Mar-09	668.90	676.31
24-Mar-09	670.73	678.00
25-Mar-09	669.71	675.30
29-Mar-09	663.68	669.74
30-Mar-09	664.68	665.66
31-Mar-09	660.39	664.13
1-Apr-09	660.11	665.04
2-Apr-09	658.40	661.96
5-Apr-09	664.18	664.73
6-Apr-09	660.38	663.46
7-Apr-09	656.09	659.54
8-Apr-09	659.74	661.28
9-Apr-09	660.86	660.36
12-Apr-09	660.26	660.15
13-Apr-09	662.71	661.27
16-Apr-09	664.72	662.71
19-Apr-09	661.33	659.95
20-Apr-09	664.14	660.01
21-Apr-09	664.40	659.06
22-Apr-09	662.52	657.33
23-Apr-09	662.38	657.02
26-Apr-09	651.39	649.04
27-Apr-09	643.85	640.16
28-Apr-09	643.15	641.64
29-Apr-09	642.66	643.44
30-Apr-09	649.56	647.78
3-May-09	640.06	642.04
4-May-09	641.59	640.89
5-May-09	650.37	648.57
6-May-09	653.41	651.16
7-May-09	658.49	654.05
10-May-09	660.83	660.42
11-May-09	657.15	659.17
12-May-09	655.48	660.05
13-May-09	658.40	661.55
14-May-09	658.53	660.96
17-May-09	668.02	665.70
18-May-09	689.87	683.92

19-May-09	682.44	678.61
20-May-09	676.64	677.20
21-May-09	676.11	676.64
24-May-09	691.52	688.07
25-May-09	712.14	701.51
26-May-09	731.78	714.72
27-May-09	768.92	739.89
28-May-09	736.55	718.62
31-May-09	722.72	707.89
1-Jun-09	719.60	699.95
2-Jun-09	723.55	703.01
3-Jun-09	724.19	699.62
4-Jun-09	717.11	698.88
7-Jun-09	702.53	685.61
8-Jun-09	695.06	679.73
9-Jun-09	705.60	684.88
10-Jun-09	709.36	686.07
11-Jun-09	706.12	684.39
14-Jun-09	696.78	678.74
15-Jun-09	697.01	676.41
16-Jun-09	698.82	681.83
17-Jun-09	703.05	682.80
18-Jun-09	704.35	683.71
21-Jun-09	697.28	679.23
22-Jun-09	695.08	678.52
23-Jun-09	688.66	671.47
24-Jun-09	689.15	670.25
25-Jun-09	690.21	670.61
28-Jun-09	683.37	666.35
29-Jun-09	681.71	663.96
30-Jun-09	679.64	662.63
1-Jul-09	680.10	661.78
2-Jul-09	685.03	667.43
5-Jul-09	695.77	675.16
6-Jul-09	697.42	676.14
7-Jul-09	711.03	685.55
8-Jul-09	729.87	696.16
9-Jul-09	736.57	702.88
12-Jul-09	750.96	711.06
13-Jul-09	754.67	717.46
14-Jul-09	780.24	743.69
15-Jul-09	780.87	749.10

Source: www.nepalstock.com

APPENDIX - 3

Names and Number of Observations of the Sampled Company

(From July 16 2008 to July 16 2009)

Based on Daily Closing Price

S.NO	Name of the company	No. of Observations
1	Nabil Bank Limited	205
2	Standard Chartered Bank	199
3	Himalayan Bank Limited	190
4	Nepal Bangladesh Bank	212
5	Bank of Kathmandu	220
	Total	1026

Sources: Based on official records of daily closing price of share transaction in NEPSE

APPENDIX-4

Frequencies

	NABIL	SCB	HBL	NB	BOK
N	205	199	190	212	220
Mean	3102.96	4360.09	1180.02	309.83	981.85
Std. Deviation	617.87	476.68	138.77	78.08	122.17
Variance	381758.78	227221.07	19257.17	6096.14	14924.75
Minimum	2035.00	3058.00	930.00	199.00	699.00
Maximum	5050.00	5900.00	1760.00	550.00	1375.00

APPENDIX-5

Simple Regression
Amount on Public issue
Model Summary

	Model
	1
R	.767(a)
R Square	.589
Adjusted R Square	.451
Std. Error of the Estimate	145.37671
F	4.291

a Predictors: (Constant), AMT

Coefficients (a)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta	B	Std. Error
1	(Constant)	60.598	157.106		.386	.725
	AMT	.186	.090	.767	2.071	.130

a Dependent Variable: NEPSE

Paid up Value
Model Summary

	Model
	1
R	.899(a)
R Square	.809
Adjusted R Square	.745
Std. Error of the Estimate	99.03124
F Change	12.712

a Predictors: (Constant), PAIDUP

Coefficients(a)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta	B	Std. Error
1	(Constant)	-386.550	213.160		-1.813	.167
	PAIDUP	.044	.012	.899	3.565	.038

a Dependent Variable: NEPSE

Annual Turnover
Model Summary

	Model
	1
R	.929(a)
R Square	.864
Adjusted R Square	.819
Std. Error of the Estimate	83.6025 8
F Change	19.047

a Predictors: (Constant), TURNOVER

Coefficients(a)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta	B	Std. Error
1	(Constant)	120.515	65.809		1.831	.164
	TURNOVER	.062	.014	.929	4.364	.022

a Dependent Variable: NEPSE

APPENDIX-6

Multiple Regressions

Model Summary

	Model
	1
R	.981(a)
R Square	.962
Adjusted R Square	.849
Std. Error of the Estimate	76.36459
F Change	8.475

a Predictors: (Constant), TURNOVER, AMT, PAIDUP

Coefficients (a)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta	B	Std. Error
1	(Constant)	-775.984	571.622		-1.358	.404
	AMT	-.291	.224	-1.196	-1.295	.419
	PAIDUP	.091	.059	1.862	1.535	.367
	TURNOVER	.015	.033	.221	.450	.731

a Dependent Variable: NEPSE

APPENDIX-7

Daily Autocorrelation coefficient for Lag 1 to 10, having natural log difference 1

Name of the company	Lag days									
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
NABIL	.258	.184	-.066	-.040	.014	.025	.038	-.076	.024	.055
SCB	.125	-.051	-.087	.023	-.018	-.032	-.131	-.010	-.073	-.035
HBL	-.182	.051	-.057	-.046	-.106	-.064	.005	-.014	.039	.016
NB	-.132	.247	-.023	-.014	.008	.014	-.084	-.058	-.056	-.027
BOK	.009	-.087	-.075	.063	-.058	.008	-.039	-.019	.015	.048
Average	0.0156	0.0688	-0.0616	-0.0028	-0.032	-0.0098	-0.0422	-0.0354	-0.0102	0.0114

A. The underlying process assumed is independence (white noise).
B. Based on the asymptotic chi-square approximation.

APPENDIX-8

Distribution of Signs of Coefficients

Lag	Number of +sign	Number of -sign	Total
1	3	2	5
2	3	2	5
3	0	5	5
4	2	3	5
5	2	3	5
6	3	2	5
7	2	3	5
8	0	5	5
9	3	2	5
10	3	2	5
TOTAL	21	29	50

APPENDIX-9

Standard Error (S.E.) of the Stocks

Name of the company	Lag days									
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
NABIL	.070	.067	.065	.064	.065	.065	.065	.064	.064	.065
SCB	.070	.064	.064	.065	.065	.064	.064	.064	.064	.064
HBL	.072	.069	.068	.067	.068	.067	.067	.066	.065	.064
NB	.068	.066	.065	.065	.065	.065	.065	.065	.065	.065
BOK	.067	.065	.065	.065	.065	.065	.065	.065	.065	.065

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